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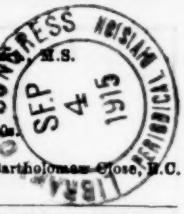

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CONTENTS.

The whole of the literary matter in THE LANCET is copyright.

THE CAVENDISH LECTURE on a New Theory of the Causation of Enterostasis. Delivered before the West London Medico-Chirurgical Society on June 25th, 1915, by ARTHUR KEITH, M.D., LL.D. Aberd., F.R.S., Conservator of Museum, Royal College of Surgeons, England 371

ORIGINAL ARTICLES.

Some Notes on the Bacteriology of Gas Gangrene. By ALEXANDER FLEMING, F.R.C.S. Eng., Assistant Lecturer in Bacteriology, St. Mary's Hospital, and Pathologist to the London Lock Hospitals. (From the Research Laboratory attached to No. 13 General Hospital, Boulogne.)—(*Illustrated*) 376

Further Observations on the Bacteriology of the Peritoneal Exudate in Cases of Perforation of the Stomach and Duodenum. By LEONARD S. DUDGEON, F.R.C.P. Lond., and B. C. MAYBURY, M.B., B.S. Lond., F.R.C.S. Eng., late Resident Assistant Surgeon, St. Thomas's Hospital 379

An Atypical Epidemic, with a Note on the Evolutionary Etiological Factors in Disease. By J. T. C. NASH, M.D. Edin., D.P.H. Camb., County Medical Officer of Health for Norfolk 382

An Epidemic of Acute Hydrocele and Orchitis in British East Africa. By LUCIUS NICHOLLS, B.A., B.C., M.D. Cantab., Captain, East African Medical Service 384

Temporary Blindness from a Penetrating Bullet Wound of the Occipital Lobe. By A. BISDELL MOORE, M.D. Edin., Lieutenant, Royal Army Medical Corps.—(*Illustrated*) 385

A New Sign and its Value in the Diagnosis of Pulmonary Tubercle. By CLIVE RIVIERE, M.D. Lond., F.R.C.P. Lond., Physician, East London Hospital for Children, Shadwell, E.; Physician to Out-patients, City of London Hospital for Diseases of the Chest, Victoria Park, E. — (*Illustrated*) 387

REVIEWS AND NOTICES OF BOOKS.

Symbiogenesis, the Universal Law of Progressive Evolution. By Hermann Reinheimer 392

The Tonsils—Faucial, Lingual, and Pharyngeal—with some Account of the Posterior and Lateral Pharyngeal Nodules. By Harry A. Barnes, M.D. 392

Case Histories in Pediatrics. By John Lovett Morse, A.M., M.D. Second edition 393

Cystoscopy and Urethroscopy for General Practitioners. By Bransford Lewis, B.S., M.D., F.A.C.S., and Ernest G. Mark, A.B., M.D., F.A.C.S. With a chapter by William F. Braasch, M.D. 393

The Determination of Sex. By L. Doncaster, Sc.D. 394

Sanitation in War. By Major P. S. Lelean, F.R.C.S. Eng., R.A.M.C. 394

University College Hospital Medical School (University of London) Research Department. Director, Dr. Charles Bolton. Collected Papers. Vol. IV. 394

Kent's Care for the Wounded. By Paul Creswick, G. Stanley Pond, and P. H. Ashton 394

Aids to Tropical Medicine. By Gilbert B. Brooke. Second edition 395

Lessons in Elementary Hygiene and Sanitation, with Special Reference to the Tropics. By W. T. Prout, C.M.G., M.B., C.M. Edin. Fourth edition 395

Miscellaneous Volumes 395

Quarterly Journal of Experimental Physiology. Editors: E. A. Schäfer, W. D. Halliburton, C. S. Sherrington, E. H. Starling, and A. D. Waller. Vol. IX., No. 1 396

NEW INVENTIONS.

A New Universal Portable Splint.—(*Illustrated*) 396

A Note on Wick Drains.—(*Illustrated*) 397

LEADING ARTICLES.

THE TREATMENT OF WOUNDS IN WAR 399

THE FOOD-SUPPLY OF THE GERMAN PEOPLE 399

ANNOTATIONS.

An Anatomist on Ethnology ... 400

"Ghosts" on the Cinema 401

Multiple Abscess of the Brain: Recovery after Operation 401

The Prevention of Scarlet Fever and Measles 402

Necrosis of Half a Patella 402

Hæmorrhagic Varicella 402

The Causation and Treatment of Pellagra 403

Lesions of the Cervical Cord in the War 403

Air Raids and Surgical Operations 404

PUBLIC HEALTH.

Annual Reports of Medical Officers of Health 407

VITAL STATISTICS:

Health of English Towns 408

Health of Scotch Towns 409

Health of Irish Towns 409

SPECIAL ARTICLES.

A Monthly Record of Atmospheric Pollution. — Committee for the Investigation of Atmospheric Pollution: Summary of Reports for Month ending April 30th, 1915 398

Sir Felix Semon and the Internationales Centralblatt für Laryngologie 404

The Belgian Doctors' and Pharmacists' Relief Fund: The Central Committee.—The Week's Subscriptions.—The Appeal for Surgical Instruments 405

Notes from India: Scientific Research in India.—Assam Lunatic Asylum.—The late Lieutenant-Colonel Ewens, I.M.S. 405

Medical Service in the Highlands and Islands 406

The Services: Royal Navy Medical Service.—Royal Army Medical Corps.—Special Reserve of Officers.—Territorial Force 409

CORRESPONDENCE.

Acetone Bodies in the Urine (Dr. Walter G. Smith) 410

Medical Organisation and the War (Lieutenant-Colonel Henry Smith, I.M.S.) 411

Cerebro-spinal Meningitis (Dr. J. O. Shircore) 411

Medical Students and Combatant Commissions (Professor W. D. Halliburton) 413

Hæmoptysis due to High Tension (Dr. Arthur J. Hall) 413

The Right-sided Murmurs of Mitral Stenosis (Dr. H. Walter Verdon) 414

Mechanical Factors in the Eyeball (Dr. Horatio Matthews) .. 414

Diseased Tonsils in Relation to Rheumatism (Dr. Seymour Taylor) 414

Acute Post-operative Capillary Bronchitis (Dr. H. Lawson Whale) 415

"Transient Renal Congestion" (Dr. A. Charpentier) 415

Indian Doctors and Vacant Appointments (Dr. C. Muthu) 415

The Therapeutic Uses of Turpentine (Dr. Rowland H. Coombs) 416

A New Antiseptic (Mr. Fredk. W. Alexander) 416

THE WAR.

The Casualty List 417

The Honours List 417

Mentioned in Despatches 417

Deaths among the Sons of Medical Men 417

The Treatment of Injuries in War 418

War Emergency Committee and Medical Officers for the Army 419

Scottish Medical Service Emergency Committee 420

The Sick and Wounded in France: Notice from the Army Council 420

The Loss of the *Royal Edward* 421

Tifo Petecchiale in the Austrian Ranks 421

Vacancies for Medical Officers .. 421

Graduates of Queen's University, Belfast, and the War 421

British Ambulance Unit for Italy 421

Laval University, Quebec 421

Wounded Soldiers in Belfast 421

New War Hospital at Ramsgate 421

Belgian Honour for an English Medical Officer 421

An Ambulance Train 422

OBITUARY.

Sir Peter Bade, M.D. Lond., F.R.C.P. Lond., Honorary Fellow of King's College, London; Consulting Physician, Norfolk and Norwich Hospital, Norwich Dispensary, and Jenny Lind Infirmary for Sick Children 416

MEDICAL NEWS.

Bristol Royal Infirmary 378

Presentation to a Medical Man 381

Inaugural Addresses at the Opening of the Winter Medical Session 400

The Health of Falmouth in 1914 406

The late Dr. R. Freeman, of Plymouth 407

The Welsh National School of Medicine 422

Appointments 422

Vacancies 422

Births, Marriages, and Deaths .. 423

Books, &c., received 423

Notes, Short Comments, and Answers to Correspondents ... 424

Medical Diary 425

Meteorological Readings 425

Acknowledgment of Communications received 426

FOR INDEX TO ADVERTISEMENTS SEE PAGES 2 & 4.

INDEX

MEDICAL AND OTHER BOOKS AND PUBLICATIONS

PAGE

BAILLIERE, TINDALL & COX:—
Bigg..... Indigestion 3
" ..... War Diseases (Typhus, Enteric, Dysentery, and Cholera)..... 3
Heath ..... Aural Suppuration: Its Arrest, with Preservation of the Hearing ..... Cover 1
Morison.... Disorders of Heart Cover 1
Mummery .. Diseases of the Colon and their Surgical Treatment .. Cover 1

BALE, SONS & DANIELSSON:—
Moullin.... When to Operate in Inflammation of the Appendix .. Cover 1

CHURCHILL, J. & A.:—
Hare ..... On Alcoholism: Its Clinical Aspects and Treatment .. Cover 1

PAGE

CHURCHILL—(Continued).
Important New Books on Surgery Cover 1

FROWDE AND HODDER & STOUGHTON:—
McCann .. Cancer of the Womb: Its Symptoms, Diagnosis, Prognosis, & Treatment .. Cover 1

GRIFFIN & CO.:—
West ..... Diseases of the Organs of Respiration 3

HODDER & STOUGHTON:—
Wood ..... Health Resorts of the British Islands Cover 1

PAGE

LEWIS & CO:—
Moullin .... Enlargement of the Prostate .... Cover 1

MACMILLAN & CO.:—
Allbutt, Sir Clifford .. Diseases of Arteries, including Angina Pectoris 3
Huxley .... Lessons in Elementary Physiology.. .. 3

MEDICAL PUBLISHING CO.:—
Lane, Sir A. .... Operative Treatment of Fractures. Cover 1

MURRAY:—
Brunton, Sir L. .... Therapeutics of the Circulation.. Cover 1

NISBET & CO.:—
Romer & Creasy .. Bonesetting and the Treatment of Painful Joints.... Cover 1

PAGE

PULMAN & SONS:—
Elliot ..... Sclero-Corneal Trephining in the Operative Treatment of Glaucoma 3

WRIGHT & SONS (BRISTOL):—
Index of Prognosis and End-Results of Treatment 3
Morison .... Introduction to Surgery ..... Cover 1

MEDICAL LIBRARIES, &c.:—
Behnke—
Stammering, Lisping, and Cleft-Palate Speech 3
Ketley—
Stammering..... 3
Matthews—
Wood: Application of Trusses to Hernia 3

OFFICIAL AND GENERAL ANNOUNCEMENTS

APPOINTMENTS VACANT:—
Anglo-Serbian Hospital 48
Birmingham and Midland Ear and Throat Hospital 47
Birmingham and Midland Eye Hospital 48
2nd Brigade Scottish Horse 48
Bristol Royal Infirmary 46
Bury Infirmary 45
Bury St. Edmunds Union 46
City Fever Hospital, Birmingham 47
County Asylum, Chester 46
County Asylum, Prestwich, Manchester..... 45
County Borough of Portsmouth .. 47
Dorset County Council Education Committee 47
East Sussex Hospital, Hastings .. 47
Elder Dempster & Co., Liverpool.. 48
Glasgow Royal Maternity and Women's Hospital 47
High Carley Sanatorium, near Ulverston 48
Hulme Dispensary, Manchester .. 47
Leeds Public Dispensary 47
Liverpool Eye and Ear Infirmary. 45
Liverpool Infirmary for Children.. 47
Liverpool Sanatorium 47
Manchester Northern Hospital for Women and Children..... 48
Manchester Royal Infirmary 47
Middleton-in-Wharfedale Sanatorium 48
North Ormesby Hospital, Middlesbrough 47
Nottingham General Hospital.... 47
Parish of Tingwall, Whiteness, and Weisdale 47
Queen's Hospital for Children, Bethnal Green 45
Royal Albert Hospital, Devonport 46
Royal Albert Edward Infirmary and Dispensary, Wigan..... 48
Royal Free Hospital, Gray's Inn-road 47
Royal Salop Infirmary, Shrewsbury 48
Royal Surrey County Hospital, Guildford 45
Royal Victoria Hosp., Folkestone. 45
St. Mary's Hospital, Paddington.. 48
St. Peter's Hospital for Stone, &c. 48
Salisbury Infirmary..... 48
Sheffield Royal Infirmary 46
Storthes Hall Asylum, Kirkburton 47
Surrey Education Committee 45
Swansea Education Committee .. 47
University of Durham College of Medicine, Newcastle-upon-Tyne 47
Walsall and District Hospital 45
Welsh Metropolitan War Hospital, Whitchurch 48

APPOINTMENTS—(Continued).
West Ham and Eastern General Hospital..... 45
West Ham Union Infirmary and Workhouse 48
Westminster General Dispensary. 48
Whitechapel Union Infirmary 47

ASSISTANCIES, MEDICAL:—
Arnold & Sons, Giltspur-street.... 48
Bibby Line, Liverpool..... 48
Blundell & Rigby, Strand..... 48
Box T 534, Liverpool 48
Davies, Clapham 43
L 345, King William-street 48
No. 538, L.O., Strand 48
No. 537, L.O., Strand 48
No. 539, L.O., Strand 48
No. 542, L.O., Strand 48
Pacific Line, Liverpool 48
Summerhays, Eastcheap 48
Turner, Adam-street 48

ASYLUMS, HOMES, &c.:—
Abbotswood House, Cinderford .. 42
Ashwood House, Kingswinford .. 43
Barnsley Hall, Bromsgrove 43
Barnwood House Hospital 44
Bishopstone House, Bedford..... 43
Brunton House, Lancaster 45
Buntingford House Retreat, Buntingford 41
Camberwell House, Peckham-road 40
14, Camden-square, N.W..... 45
Capel Lodge Retreat and Sanatorium, near Folkestone 42
Cheadle Royal..... 44
City of London Mental Hospital., Stone..... 45
Clarence Lodge, Clapham Park .. 39
Colshurst House, Alderley Edge .. 39
Coppice, The, Nottingham 44
Court Hall, Kenton, near Exeter.. 43
Dalrymple House, Rickmansworth 42
David Lewis Colony, Alderley Edge 39
Duff House, Banff..... 43
G., Hampstead 45
Ghyllwoods 41
Green, Killygordon 45
Grove House, Church Stretton.... 44
Grove, The, Catton, Norwich..... 44
Haydock Lodge, Newton-le-Willows 40
Heigham Hall, Norwich 44
Home for Epileptics, Maghull ... 39
Invernith Sanatorium, Colinsburgh 41
Littleton Hall, Brentwood 45
London Fever Hospital..... 44
Mailing Place, Kent 44
Melbourne House, Leicester 42
Mendip Hills Sanatorium 42
Meyrick, Brighton 45
Middleton Hall, Co. Durham..... 39
Moat House, Tamworth 44
Newmains Retreat, Lanarkshire.. 41
New Saughton Hall, Polton, Midlothian 40
Nordrach-on-Dee, Banchory 43
Northumberland House, Finsbury Park 40
Northwoods House, Winterbourne 40
Norwood Sanatorium, Ltd..... 41
No. 381, L.O., Strand 45
No. 412, L.O., Strand 45
No. 535, L.O., Strand 45
Otto House, West Kensington 39
Peckham House..... 41

ASYLUMS—(Continued).
Pendyffryn Hall Sanatorium, Nordrach-in-Wales 42
Pinewood Sanatorium, Wokingham 42
Plympton House, Plympton 44
Portsmouth Corporation Mental Hospital 39
Royal Earlswood Institution for Mental Defectives 40
St. Andrew's Hospital, Dollis Hill 45
St. Andrew's Hospital, Northampton 44
St. George's Retreat, Burgess Hill 39
St. Luke's Hospital for Mental Diseases 43
St. Raphaels, Buxted, Sussex 41
Springfield House Private Asylum, Bedford 39
Stretton House, Church Stretton.. 44
The General Manager, Cravenstreet 45
Vale of Clwyd Sanatorium 42
Warneford Asylum, Oxford..... 43
Wye House, Buxton 44

HEALTH RESORTS BATHS, &c.:—
Alexandra Therapeutic Institute.. 39
Droitwich Brine Baths 39
Smedley's, Matlock 39

HOMES WANTED:—
No. 541, L.O., Strand 49

HOUSE & ESTATE AGENTS:—
Bedford & Co., Wigmore-street .. 49
Elliott, Son & Boyton, Vere-street 49
Law Clark, Wimpole-street 49
Webber, Maidenhead..... 49
CONSULTING-ROOMS:—
15, Nottingham-place 49

LIFE & FIRE ASSURANCES, &c.:—
General Life Assurance Co. 37
National Provident Institution .. 36
Prudential..... 36

MASSAGE:—
Associated Male Nurses and Masseurs 37
London School of Massage 37

MEDICAL ACCOUNTANTS &c.:—
Turner 49

MEDICAL AGENTS:—
Fieldhall, Limited..... 50
Manchester Clerical, &c., Association 49
Medical Agency 50
Needes, Herbert 50
Needes, J. C. 50
Peacock & Hadley..... 50
Scholastic, Clerical, &c., Association 50
Turner 50

MEDICAL SCHOOLS:—
(LONDON.)
Charing Cross Hospital Medical School 34
Guy's Hospital 34
London Hospital Medical College and Dental School 34

MEDICAL SCHOOLS—(Continued).
London School of Clinical Medicine 34
Middlesex Hosp. Medical School.. 34
St. Bartholomew's Hospital and College 33
St. Mary's Hospital Medical School 34
West London Post-Graduate College 33
(PROVINCIAL, &C.)
Anderson College of Medicine, Glasgow 35
University of Bristol 35
University of Durham College of Medicine, Newcastle-upon Tyne 35

NURSING INSTITUTES:—
Army and Navy Male Nurses Co-operation 39
Co-operation of Temperance Male and Female Nurses 38
General Nursing Association..... 37
Hospital for Sick Children, Great Ormond-street 37
London Nurses' Association 38
London Temperance Male and Female Nurses Co-operation .. 38
Male Nurses Temperance Co-operation 37
Mental Nurses Association 37
Mental Nurses' Co-operation..... 37
Nurses' Co-operation, Portland-place 37
Registered Nurses' Society..... 37
St. John's House 37
St. Luke's Hospital, E.C. 39
Temperance Association of Male Nurses, Ltd..... 38
Temperance Male Nurses Co-operation 38
The Retreat, York 38

OFFICIAL NOTICES:—
City of London Lying-in Hospital 34
Guy's Hospital 34
London School of Massage..... 36
London School of Tropical Medicine 34
Queen Charlotte's Lying-in Hospital 34
St. Bartholomew's Hospital and College..... 33
University of Cambridge 36
University of London, King's College..... 34
University of London, University College..... 36

PARTNERSHIPS & PRACTICES:—
Arnold & Sons, Giltspur-street.... 48
Burch & Brooks, Canterbury..... 48
Lee & Martin, Birmingham..... 48
No. 515, L.O., Strand 49
No. 527, L.O., Strand 49
No. 538, L.O., Strand 49
No. 540, L.O., Strand 48
No. 543, L.O., Strand 49
Turner, Adam-street 48

RAILWAY & STEAMSHIP CO.'S.:—
New Zealand Shipping Co..... 37

TUTORS & LECTURERS:—
Beckton 38
Med. Correspondence College 36
Weymouth 38

For Index to Trade and Miscellaneous Advertisements see page 4.

The Cavendish Lecture
ON
A NEW THEORY OF THE CAUSATION OF ENTEROSTASIS.

Delivered before the West London Medico-Chirurgical Society on June 25th, 1915,

BY ARTHUR KEITH, M.D., LL.D. ABERD., F.R.S.,
CONSERVATOR OF MUSEUM, ROYAL COLLEGE OF SURGEONS, ENGLAND.

MR. PRESIDENT AND GENTLEMEN,—Only those of us who had completed our medical studies before 1895 are fully aware of the extent to which our knowledge of the living human body has been revolutionised by the discovery and application of the Roentgen rays. Before 1895 we had no accurate information regarding the rate of progression of food along the alimentary tract; we are now in a very different position, thanks to the labours of a younger generation, which has applied and developed Roentgen's discovery.

We now know that food is normally delayed at certain points of the alimentary canal; at the junction of the œsophagus there is a mechanism which causes a temporary delay; there is another at the junction of the stomach and duodenum which effects a more prolonged delay of the gastric contents; there is evidence for the existence of a regulating mechanism near the duodeno-jejunal junction; there is certainly a mechanism at the lower end of the ileum which regulates and retards the passage of contents from the small to the large intestine. Along the great intestine there appear to be three points at which delay may be regarded as normal: (1) Near the commencement of the transverse colon, leading to the filling of the cæcum and ascending colon; (2) at the recto-colic junction, leading to accumulation in the pelvic colon; (3) above the anal canal, leading to accumulation in the rectum. We also now know that the degree of delay at those points differs from one person to another, but after making all allowance on the score of individual variation there remain a considerable percentage of cases in which the delay at one or more of these points is so long that it must be regarded as pathological. We have been in the habit for some time past of speaking of abnormal delay above the ileo-colic junction as "ileal stasis"; clinicians also speak and write of "duodenal stasis," "gastric stasis," stasis of the proximal colon, and stasis of the distal colon; we may therefore legitimately admit œsophageal and rectal stasis to the same category. In the present state of our knowledge we may regard all of those enterostatic conditions as morbid exaggerations of normal delays which take place in the passage of alimentary contents, and may conveniently group all of them under the name of "enterostasis."

It is to the condition of enterostasis I propose to devote the Cavendish lecture of this year of war—1915—and to lay before you certain observations and inferences which appear to throw light on its nature and causation.

"NODAL" TISSUE IN THE BOWEL.

Some years ago I again took up a research on the ileo-cæcal region of the bowel, with no thought of elucidating the condition I have described to you as enterostasis, but with the definite object of throwing more light on that system of tissues in which the heart beat arises, and by which it is propagated throughout auricles and ventricles. If we were to find the beginnings of such a system, it was clear by then that the heart, a highly specialised hollow complex muscle, was not the organ we should find them in. The bowel, because of its structure and manner of action, seemed very likely to yield information regarding the early history of the "nodal" and "bundle" systems of the heart. I selected the ileo-cæcal junction of the rat's bowel as the site of my initial inquiry, because I knew that lively and complex movements arose at that junction, and inferred that if a special tissue were present in the bowel, representing the nodal tissue in which the heart beat takes its normal origin, it should be found at that site. I further inferred that if "nodal" tissue did occur there it must be directly interposed between the muscle fibres, on the one hand, and nerve fibres and nerve cells on the other; it must be of the nature of neuro-muscular tissue. It is difficult to unravel the true nature of nodal tissue in the heart of man or of the higher mammals, but in the heart of the monotreme echidna, Dr. Ivy Mackenzie and I were able to convince ourselves that there was a true and direct union between nerve and muscle fibres in the sino-auricular node.

A series of sections through the ileo-cæcal junction of the rat's bowel revealed a collar of peculiar tissue, with two extensions which passed into the anterior and posterior walls of the cæcum. In the collar or ring could be recognised nerve cells and nerve fibres, but there was also present a third element—numerous branching cells, not connective tissue in nature—with processes which united with muscle cells, on the one hand, and with the processes from true ganglionic cells on the other. I regarded these intermediate cells as a possible representation of the nodal tissue of the heart.[1] It was also clear from an examination of the series of sections that the ileo-colic collar was merely a local specialisation of the myenteric (Auerbach's) plexus.

STRUCTURE OF THE MYENTERIC PLEXUS.

I therefore began a systematic examination of Auerbach's plexus, using the methods we had found most successful while investigating the nodal system of the heart—namely, fixing specimens by a mixture of formalin and alcohol and staining with van Gieson's reagent. A number of fortunate circumstances gave me material for investigation. Sir W. Arbuthnot Lane, Sir Berkeley Moynihan, and Professor J. W. Smith gave me specimens which they had removed for the relief of intestinal stasis, and which they had preserved immediately after removal by operation, so that the tissues were perfectly preserved. I owe a special debt to my friend, Dr. W. C. Mackenzie, who placed at my disposal an extensive series of preparations showing the microscopic structure of the alimentary tract of Australian mammals, particularly of the monotremes—platypus and echidna. Professor William Wright, who had noted independently the peculiar structure of the myenteric (Auerbach's) plexus, gave me the loan of a series of undescribed preparations from the alimentary tract of the elephant. Mr. H. Wilson, prosector to the Royal College of Surgeons, provided preparations made from the alimentary tract of many vertebrate animals, so that it was possible for me to found my deductions on a fairly wide series of observations.

[1] For a preliminary description of the ileo-cæcal collar see British Journal of Surgery, 1915 vol. ii., p. 576.

The total result was to convince me that the myenteric plexus is not a simple structure composed of merely nerve cells and nerve fibres, but one of a composite texture. There are ganglion cells in the plexus and there is an ample network of particularly fine fibres. But there is also an abundant third element in the plexus—the branching intermediate cells which have been already mentioned, and which appear to become continuous with processes of certain groups of muscle cells on the one hand and with the branched processes of ganglionic cells contained in the nerve fibres of the plexus. Indeed, it is often difficult to say whether a certain intermediate branched cell is to be regarded as a muscle cell or as one of the cellular elements of the plexus, so alike are they in form and in staining reaction. In the ileo-colic junction of all mammals I met with an elaboration and modification in the myenteric plexus; in the wombat, for instance, in which the cæcum is highly developed, the ileo-colic specialisation of the myenteric tissue is very evident. On looking into the literature of the subject I found that Koelliker, in one of his earliest researches, had recognised a cellular element in the myenteric plexus which was different from any form of cell occurring in other nerve plexuses. I found further that Dr. L. R. Müller,[2] in an account published four years ago on the innervation of the bowel, states definitely that the myenteric plexus differs from a true nerve plexus both in structure and in staining reaction. He found, as I have done, that the methods which are usually effective in demonstrating the structure of true nerve tissue do not serve to bring out all the structural elements which go to make up the intramuscular plexus in the bowel.

FUNCTION OF THE MYENTERIC PLEXUS.

I therefore adopted the following conception as a working hypothesis: that the myenteric plexus represents a nodal and conducting system. I regard the intermediate branched cell as capable of assuming the appearance of either a nerve element or of a muscle element. In the heart, for instance, I hold the opinion that the sino-auricular and auriculo-ventricular nodes represent unmodified or slightly modified parts of its original myocardial nerve-plexus system, while the auriculo-ventricular bundle also represents a part of the original plexus of the heart, but a part in which the intermediate cell element had assumed more or less perfectly the form of a muscle cell and had almost replaced the nerve fibres and ganglion cells of the original plexus. Further, I was prepared to believe, on the ground of my anatomical observations, that, as in the heart, the efferent nerves, which influence the contraction, tone, and rhythm of the bowel, would not end directly in the musculature of the bowel, but in the tissue of the myenteric plexus, and that it was through the intermediation of the intermediate cell elements of the plexus that the splanchnics and vagi effected their influence on the movements of the bowel. In reaching this conclusion I was largely influenced by the observations made by Dr. T. R. Elliott[3] when he discovered that adrenalin had the same effect on the lower iliac tract as stimulation of the splanchnic nerve. In both cases he found that the ileo-colic sphincter contracted, while the rest of the iliac musculature was inhibited. The adrenalin acted, so he inferred, on some element interposed between the terminals of the splanchnic nerve and the muscle cells. The intermediate cells of the myenteric plexus answer very well to the element postulated by Dr. Elliott.

MANNER OF DEVELOPMENT.

If I am right in presuming that the myenteric plexus represents in the intestine a system which corresponds to the nodal and conducting system of the heart, then it is also to be expected that both systems should be developed in a corresponding manner. The bundle system of the heart, it will be remembered, arises from the muscle-forming stratum which lies immediately beneath the endocardium. An examination of the developing human intestine shows that the myenteric plexus arises in a corresponding manner. A section across any part of the intestine of a human fœtus in the fourth month of development shows the two muscular coats—longitudinal and circular—separated by an intermediate cellular layer, which is clearly myogenic in nature, for one can see muscle cells being differentiated from it, and being added to the longitudinal coat on the one hand and to the circular coat on the other. It is out of the same intermediate cellular layer that the myenteric plexus is developed. One may suppose that the true ganglionic cells found in the fully developed plexus are immigrant neuroblasts derived from the neural cord, but the other cells of the plexus, the intermediate branched cells, I presume to be native to the embryogenic muscle layer and really to represent immature muscle cells. Thus, a similarity in the manner of development favours the theory on which I am proceeding—that the bundle system of the heart and the myenteric plexus of the intestine represent corresponding functional structures.

RESULTS OF EXAMINATION OF VARIOUS PARTS OF THE ALIMENTARY TRACT.

My next step was to examine other parts of the alimentary tract where peristaltic movements are known to arise. Radiologists are almost unanimous in the opinion that the peristaltic waves which sweep along the pyloric part of the stomach arise in the distal or lower part of the body of the stomach. The only exception to this statement I have seen is one made by Dr. L. Gregory Cole[4]—viz., "that when food is in contact with the cardiac end of the stomach contractions begin near the fundus." A series of sections were therefore made of the stomach of a full-time child in search of a nodal centre in which the pyloric movements might take their origin. The search revealed the fact that the myenteric plexus was well developed in the pyloric division of the stomach and along the lesser curvature, but elsewhere in the fundus and along the greater part of the body of the stomach it was much less abundant. The search did not reveal any localised development of the plexus at or near the site where gastric movements appear to take their origin.

The Cardia of the Stomach.

This search in the stomach proving a disappointment, it occurred to me that the ileo-colic collar I have described might be merely part of the sphincteric mechanism which lies at the juncture of the small and great intestines. I therefore commenced an examination of the various sphincteric regions of the alimentary tract. One of the regions examined was that of the cardia of the stomach, the sections made involving the lower end of the œsophagus and adjacent part of the stomach. The sections which Mr. Wilson made from this region of

[2] Dr. L. R. Müller, Deutsches Archiv für Klinische Medizin, 1911, vol. cv., p. 1.

[3] Journal of Physiology, 1904, vol. xxxi., p. 157.

[4] Archives of the Roentgen Ray, December, 1911.

the stomach of cats and rats showed a distinct modification of the musculature and myenteric plexus just distal to the ring which marks the cessation of the œsophageal epithelium and the commencement of the gastric lining. At that site there was a definite development of neuro-muscular junctional tissue—just such an area as might serve as a nodal centre for the stomach. The structural modification at this site in the human stomach is less definite than in the rat and cat; nevertheless, one can be certain of its presence.

My belief that there was such a nodal centre at the gastro-œsophageal junction of the mammalian stomach was confirmed by an examination of Dr. W. C. Mackenzie's preparations. In the echidna, for instance, I found very similar tissue to that seen in the sino-auricular node of the same animal. Dr. Mackenzie and I found that by mechanical stimulation of the site of the nodal centre of the living stomach of a dead rabbit we could provoke, after a very short latent period, a definite form of gastric movement of more than passing interest. The movement commenced with a contraction of the gastric musculature in the immediate neighbourhood of the cardia, spreading along the smaller curvature towards the hiatus angularis, when it apparently ceased. The fundus and the greater curvature were not involved. We noted also that each cardiac movement, of the kind just described, was followed by a peristaltic wave along the pyloric part of the stomach—the movement with which radiologists are familiar. There was a distinct interval between the cardiac and pyloric contractions, but there could be no mistake about the sequence—the pyloric movement was a direct result of the initial cardiac one. I am of opinion, then, that there exists, at the gastro-œsophageal junction, a main nodal centre at which the rhythmical contractions of the stomach are initiated.

The Duodenum.

Another minor investigation drew my attention to the peculiar form and distribution of the myenteric plexus in the duodenum. Mr. Wilson had made a series of sections across the termination of the common bile duct and ampulla of Vater, so that one could study the arrangement and nerve-supply of the sphincter which surrounds the termination of the common bile duct and pancreatic duct. This sphincter is apparently concerned in regulating the flow of bile and pancreatic juice. Amongst the sections there was a series made from a human fœtus in the fifth month of development. I was struck by the rich development of the myenteric plexus—or tissue which gives rise to the plexus—in the wall of the duodenum in the neighbourhood of the ampulla of Vater. One could trace the nerve tissue from the solar plexus forming unions with it; one could see, too, that the ampullary sphincter was supplied by a direct extension from the myenteric tissue of the duodenum. An examination of the first or horizontal part of duodenum showed a poor and scattered development of the myenteric plexus; its strands appear to be direct extensions from the richer plexus in the sphincteric region of the stomach. In the second part of the duodenum the myenteric plexus is richly developed, especially on the area of the duodenum lying against the head of the pancreas above or proximal to the entrance of the common bile duct.

Radiologists are well aware that the first part of the duodenum shows only a limited degree of contractility; propulsion waves appear to arise in the second part of the duodenum. Although I have found no limited area of nodal tissue which might serve as a main centre for the duodenum, yet I am of opinion that it will be found that the richer site mentioned above—proximal to the entrance of the common bile duct—serves as such a centre.

The Colon.

A systematic examination of the specimens sent to the Museum of the Royal College of Surgeons by Sir W. Arbuthnot Lane and Sir Berkeley Moynihan gave me a knowledge of the distribution of the myenteric plexus in the great bowel and the various lesions it is subject to in cases of colitis or of intestinal stasis. I observed that the plexus was very plentiful in the distal part of the transverse colon, in the descending and iliac colons. It is well known to be highly developed in the rectum. Nowhere did I find any special plaque or area of nodal tissue, but everywhere—particularly in the descending colon—there was an abundance of intermediate cells. I was inclined to correlate the tonic properties of the transverse and descending colons with the richness of their myenteric plexus. I noted, too, that in cases of colitis there was the same form of fibrosis of the muscular coat as one sees in the myocardium of diseased hearts—a fibrosis in which meshes of the myenteric plexus are often involved. I noted, further, that in cases of colitis and of intestinal stasis there were structural changes in the cellular elements of the plexus.

THE RHYTHM OF DIFFERENT INTESTINAL SEGMENTS.

My search for a nodal system along the alimentary tract had reached the stage just described when I had the good fortune to visit Dr. W. B. Cannon in his laboratory at Harvard University, where I found him using pieces of living bowel as agents for estimating the quantity of adrenalin in any given solution. He told me of a research lately carried out in his laboratory by Dr. Alvarez, who found that the commencement of the second part of the duodenum dominated the rhythm for the whole duodenal loop. When the duodenal loop was cut out in segments and each segment kept alive in Locke's solution, the rhythm or beat was fastest in the segment from the commencement of the second stage and slowest in the segment from the end of the loop. On my theory the upper segment had the greater amount of nodal tissue, and was therefore the pacemaker of the duodenal rhythm.

Dr. Alvarez found that the first segment of the jejunum has a slightly higher or faster rhythm than in the last part of the duodenum, but that from the first part of the jejunum to almost the last part of the ileum the rate of rhythm decreased. At the last part of the ileum, if a piece of the ileo-cæcal junction were left attached to it, the rate actually increased, but only if the ileo-cæcal junction were left attached. That fact interested me, because it was explicable if I were right in regarding the ileo-colic collar as a nodal centre—as a pacemaker for the cæcum and ascending colon.

SPHINCTERIC MECHANISMS.

Before reading Dr. Alvarez's researches I was seeking for an explanation of the various conditions I have described under the name of enterostasis in a derangement of certain sphincteric mechanisms which are distributed, for functional purposes, along the alimentary tract. My conception of the organisation of these mechanisms was founded on the workings of the sphincters of the bladder and of the anus. The sphincters

of the urethra and anal canal are inhibited whenever the contents of the bladder or rectum are brought in contact with the mucous membrane lining them. One could conceive these sphincteric mechanisms being damaged and deranged in many different ways. Everyone knows that a pill or tabloid may be arrested at the cardiac orifice of the stomach. Its arrest is very probably due to the fact that it cannot enter the orifice as a fluid bolus can, and thus bring about the inhibition of the sphincter at the cardia. We are becoming aware that the relaxation of the pyloric sphincter may be influenced by many different conditions. It is true that there is no structural differentiation of a sphincter in the terminal part of the duodenum, and yet I am certain that duodenal distension and stasis is not an infrequent condition.

Dr. A. C. Jordan and other radiologists have published many photographs demonstrating the condition. I agree with Dr. A. F. Hertz that duodenal stasis is not due to a "kinking" at the duodeno-jejunal junction, for all radiograms I have examined of this condition show that the blockage is near the junction of the second with the third parts of the duodenum, at a point where "kinking" or a mechanical form of obstruction could not be produced. At the point where duodenal blockage takes place there is neither an anatomical sphincter nor an arrangement of parts which could produce an obstruction by mechanical means.

ILEAL AND COLIC STASIS.

In ileal stasis, the most common and most serious of enterostatic conditions, there is clearly some obstructive force at work in the neighbourhood of the ileo-cæcal junction, delaying the passage of the iliac contents. There is no well-marked anatomical sphincter there comparable to the pyloric sphincter, but beyond doubt there is, in the terminal part of the ileum, an elaborately organised sphincteric mechanism, and there are also peritoneal bands and folds, both of embryonic and post-embryonic origin. One can perceive that the sphincteric mechanism might become disordered, or that in the upright position of the body the peritoneal bands might produce a mechanical obstruction; in either case, an ileal stasis would result. A critical examination of radiograms taken from cases of ileal stasis does show a number in which the bismuth shadow in the terminal part of the ileum is reduced to a thread, or is empty as if there was a spastic condition of the terminal iliac sphincteric tract, but I have not seen a single radiogram showing a sharply marked obliteration of the terminal ileum, such as might be caused by the constricting or dragging action of a peritoneal band or adherent appendix. In the majority of cases of ileal stasis there is neither evidence of a spastic sphincter nor of an obstructing band. There is clearly some other factor at work, which we have not yet taken into account.

Stasis of the proximal colon—of the cæcum and ascending colon—may be explained by an appeal to mechanical means or to a functional derangement of the colic musculature, or to a combination of both of these factors. Sir W. Arbuthnot Lane is persuaded that the delay in the proximal colon is mainly the result of mechanical means, of prolapse of various segments of the colon with the formation of peritoneal bands and the production of obstructing kinks. Radiograms have failed to produce evidence of obstruction situated at bands or kinks; there is no hypertrophy of the muscular coats above the site of such bands or kinks; when acute flexures of the bowel are produced experimentally, stasis does not result (Murphy and Cannon); those familiar with comparative anatomy know how much the bowel may be inflected, twisted, coiled, or acutely folded without any obstruction resulting. On the other hand, the evidence is fairly complete which points to a gross derangement in the action of the musculature of the transverse, descending, and iliac colons in cases of stasis of the great bowel. There is a general agreement among clinicians that in most cases of colic constipation there is a marked increase in the tonus of these segments of the colon; in many cases the muscle has become almost spastic in its manner of working.

INTESTINAL RHYTHM.

It will be thus seen that I do not think either mechanical conditions or even derangements of sphincteric mechanisms can give an adequate explanation of all the phenomena of enterostasis. But when we transfer from the heart to the alimentary tract not only the anatomical and physiological data relating to its nodal and conducting system, but also our knowledge of cardiac pathology of heart-block or auricular fibrillation, of extrasystole, and of delay in conductivity, we seem to reach a more rational explanation of the motor derangements of the alimentary tract. One has to remember a fact with which physiologists are familiar—namely, that all the non-striated muscle of the body, the musculature of the alimentary tract, of the bladder, uterus, and ureter, has the same property as cardiac muscle—a power of rhythmical contraction which it continues to exercise as long as it is alive. I do not know who was the first to show that any piece of excised intestine manifested that property; my own knowledge of it was derived from the well-known paper published by Bayliss and Starling in 1899.[5] They demonstrated the intrinsic beat of bowel muscle; they found that every piece of bowel possessed a double rhythm or beat—a rapid one in which contraction waves arose at the rate of 10 to 20 a minute, and a slow and concurrent one in which the contraction waves arose at the rate of one or two a minute. They further showed that the slow beats gave rise to true peristaltic waves. The more rapid and slight rhythm was concerned with division and mixing of the intestinal contents. It is also probable, as Mall[6] originally indicated, that the more rapid and rhythmical contraction is directly concerned in the maintenance of the portal circulation. The musculature of the whole intestinal tract has its pulse. The appendix, although it has a peculiar arrangement of the myenteric plexus and evidently possesses a peculiar mechanism for becoming filled and emptied, has also a double rhythm of the same kind as is found in the rest of the alimentary tract.[7]

Rhythmical Zones.

The researches carried out by Dr. Alvarez[8] in Dr. Cannon's laboratory carry our knowledge of the intestinal rhythm another step onwards. His investigations were concerned with only two parts of the alimentary tract, but so far as they relate to these parts they have a definite significance. The inherent power of rhythmical contraction, as

[5] Journal of Physiology, 18-9, vol. xxiv., p. 99.
[6] Johns Hopkins Hospital Bulletin, 1896, vol. i., p. 37.
[7] See Observations on the Movements of the Isolated Appendix, by James A. Gunn and R. H. A. Whitelocke, British Journal of Surgery, 1914, vol. ii., p. 92.
[8] American Journal of Physiology, 1914, vol. xxxv., p. 177; 1915, vol. xxxvii., p. 267.

measured by the number which arise per minute, decreases as one passes along the duodenal loop; at the commencement of the jejunum there is an enhanced power which decreases as one descends to the terminal part of the ileum. At the ileo-colic junction we enter a new zone, with a higher initial rhythm than that of the terminal part of the iliac zone, for from Dr. Alvarez's experiments I infer that the ileo-colic collar represents the pacemaker of the proximal colon. How far the proximal colic zone extends in the human bowel one cannot as yet tell, but it probably stretches beyond the hepatic flexure into the transverse colon, reaching a point corresponding to that in the colon of the cat and dog, where antiperistaltic waves are known to arise. Antiperistaltic waves are only possible when a distal nodal centre has gained or possesses an ascendency in excitability over the centre which lies at a higher proximal point in the alimentary tract.

So far I have sought to distinguish four rhythmical zones in the intestine—a duodenal, a jejuno-iliac, a proximal colic, and a distal colic. But on the imperfect evidence already available there are grounds for presuming two more—a gastric and œsophageal. I am of opinion that the nodal tissue round the cardia acts as the pacemaker of the stomach; the gastric rhythm appears to arise there and spread along the lesser curvature to the pyloric part of the stomach, where the gastric zone ends.

Inhibition of Peristaltic Waves.

Why is it that the gastric waves do not spread into the duodenum and dominate the rhythm of that segment of the bowel? Between the stomach and duodenum there is every form of bridge required for the conduction of an impulse; there is a direct connexion of musculature and of myenteric plexus, and yet physiologists and radiologists agree that gastric waves do not pass beyond the pylorus. They are inhibited or arrested there. I think the peculiar nature of sphincteric muscle explains that arrest. It is well known that in a certain stage of contraction a muscle passes into a refractory period. John Hunter recognised that the peculiarity of a sphincter was that its normal condition was one of contraction. A muscle in a state of contraction must be a muscle with an almost continuous refractory period—a muscle which will serve as a natural block for contraction waves. Dr. Alvarez observed that the duodenum only manifested its inherent fast rhythm when freed from the pylorus; the pyloric sphincter evidently exercises an inhibitory action on the first stage of the duodenum; radiologists are familiar with its open distended state. Its functional condition can be explained on the well-known Bayliss-Starling law; contraction of one segment of the bowel causes inhibition of contraction in the segment just distal to it. The pylorus is the contracting segment, and the first stage of the duodenum the inhibited one.

It is clear that the excitability and contractility of the œsophagus diminish as the stomach is approached; as at the pylorus the peristaltic waves which propel the food downwards do not pass into the musculature of the stomach, but are arrested or inhibited at the cardia.

THEORY OF INTESTINAL STASIS.

I have now laid the basis of the theory on which I seek to explain the nature of enterostasis. In passing along the alimentary tract food is propelled through a series of zones or segments, each furnished with its own pacemaker and its own rhythmical contractions. In the heart we find two such zones—an auricular and a ventricular; in the normal heart the sino-auricular node is the master pacemaker. But a block or imperfection in conduction may occur between the two zones of the heart, with the result that "back-pressure"—a venous stasis—is produced. Now, seeing the similarity between the cardiac and alimentary motor mechanisms, we do not seem over-presumptuous if we suppose that irregularities may occur in the nodal and conducting system of the alimentary canal—irregularities of the same kind as are known to occur in the heart. When such irregularities or blocks do occur we should expect to find them at the points where one rhythmical zone or area passes into the succeeding zone. That is exactly what we do find. We find a block where the œsophagus joins the stomach; we find another where the gastric zone ends and the duodenal begins; we find it where the duodenal zone passes into jejunal and where the jejuno-iliac passes into the ileo-colic. We find a block may occur at any point of passage from a lower to a higher rhythm. At several of these junctional points sphincters are situated and I do not deny that the mechanism of such sphincters may become disordered and cause stasis of the alimentary contents, but it will probably be found that a disturbance in the action of a sphincter is but part of the disturbance which affects the entire rhythmical segment to which it belongs.

Further, it is clear that to obtain an orderly propulsion of the food along the whole length of the alimentary canal those various rhythmical zones must be closely coördinated in their action, and there is a growing body of evidence, both experimental and clinical, that points to a very close coördination by means of a complicated system of reflexes. Disturbance in any one segment upsets the rhythm in all the segments. Bayliss and Starling observed that distension of the duodenum inhibited the action of the ileum; surgeons are familiar with the fact that a duodenal disturbance upsets the rhythm of the stomach. From the facts already mentioned it is easy to see that disturbance in the excitability and rhythm of the pacemaker of the cæcum will be reflected to the lower ileum. One can understand, on the hypothesis I place before you, how stasis in the great bowel may be followed by ileal stasis, duodenal or gastric stasis, or how a disturbance of the conductivity or excitability of any of the rhythmical zone may ultimately give rise to stasis in all.

I should do Sir W. Arbuthnot Lane, who has forced medical men the world over to investigate and attempt to relieve a condition which causes nearly as much suffering as even a great war, less than justice if I expected you to adopt the hypothesis of intestinal stasis I have laid before you in place of his simpler mechanical explanation. I know he will not mind me describing his explanation of enterostasis as the "drag, band, and kink" theory. My hypothesis, you will find, has certain advantages over his. In the first place, I bring into the foreground the musculature of the alimentary tract, which is recognised by all as the sole propelling power in the intestinal wall. In his theory a defect in the musculature of the bowel takes a very minor part in the causation of stasis. Further, my theory is the more in harmony with the appearances observed by clinicians and pathologists, and because it rests on a better basis of anatomical and physiological fact I believe it will ultimately win.

SOME NOTES ON THE BACTERIOLOGY OF GAS GANGRENE.

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THIS paper is based on observations made in the latter months of 1914 on cases of wounded soldiers in the hospitals in Boulogne, where I had the opportunity of studying these cases in Sir Almroth Wright's research laboratory. We have bacteriological records of 32 cases of so-called gas gangrene or gas phlegmon, and we have examined microscopically materials from a considerable number of other cases of the same nature. The bacteriology of all these was, however, essentially the same, so I will confine myself to the first series.

TABLE I.—*Cases of Gas Gangrene.*

No.	Nature of injury.	B. aerogenes capsulatus.	Streptococcus.	Other organisms.
1	Compound fracture of femur.	+	+	Staphylococcus albus not seen in pus, but appeared in culture.
2	" " humerus.	+	+	
3	" " femur.	+	+	B. proteus; B. tetani very numerous.
4	" " fibula.	+	+	B. Y.
5	" " femur.	+	+	
6	" " "	+	+	B. tetani; B. proteus.
7	" " "	+	+	B. X.
8	" " "	+	+	
9	" " humerus.	+	+	B. tetani. In superficial blister only B. aerogenes capsulatus and B. tetani found.
10	" " femur.	+	+	B. tetani; B. proteus.
11	" " humerus.	+	+	B. tetani.
12	" " femur.	+	+	B. X.
13	" " tarsal bones.	+	—	B. X. Later developed streptococcal septicæmia
14	" "	+	+	
15	" " femur.	+	+	B. tetani.
16	" " "	+	+	B. X. B. tetani developed in culture.
17	" " "	+	+	
18	" " "	+	+	
19	" " "	+	—	
20	" " humerus.	+	—	B. tetani.
21	" " femur.	+	+	B. tetani; B. X.
22	Wound of thigh.	+	+	Staphylococcus albus and B. proteus appeared in culture.
23	Compound fracture of femur.	+	+	
24	" " humerus.	+	+	B. X.
25	" " femur.	+	+	B. Y.
26	Wound of knee-joint.	+	+	B. X.
27	Compound fracture of humerus.	+	+	Anaerobic diphtheroid bacillus.
28	" " "	+	+	Slender Gram + bacillus which did not appear in culture.
29	Wound of thigh.	+	—	
30	" "	+	+	
31	Compound fracture of femur.	+	+	
32	" " "	+	+	B. proteus.

In this table I have named two of the bacilli found "X" and "Y." These are both spore-bearing anaerobic bacilli which are responsible largely for the foul smell of the gangrenous wounds. I have been unable to demonstrate any pathogenic action of these bacilli. The bacteriological findings are set forth above in tabular form. In every case we found the dominant organism to be B. aerogenes capsulatus. Rarely it was apparently in pure culture. Commonly it was associated with streptococci and frequently other organisms were present.

In the very numerous class where only B. aerogenes capsulatus and streptococci were present the gas production must clearly have been due to the former, as we know well that streptococcus is incapable of gas production in tissues. We shall see later, however, that the streptococcus aids B. aerogenes capsulatus as a gas producer in blood serum. Again, B. aerogenes capsulatus was the only one of the organisms which we have isolated from these gangrene cases which was capable of reproducing the condition in animals. There seems to be no doubt that it is this organism which was responsible for the emphysema of the tissues in these cases. We have not been able to discover the bacillus of malignant œdema (vibrion septique) in any one of the cases examined.

In all the cases in which I saw gas gangrene develop the wound was situated in the upper or lower extremity, and much more commonly in the latter. I have not seen the condition follow a wound of the trunk. Again, wounds in which the B. aerogenes capsulatus exercised its gas-producing properties were those in which the drainage was deficient, so that there resulted a gross infection of the imprisoned discharges which ultimately proved too strong for the resistance of the tissues, and resolved itself into an infection of the tissues themselves with the gas-producing organism. In some of the cases the gangrenous condition of the limb resulted from the mechanical obstruction of the circulation due to interference with the arterial channels of the limb, but in others the blockage of the artery was apparently the result of a septic process spreading to the vessel. The bacteria found depended to a certain extent on the portion of the limb from which the material for examination was obtained.

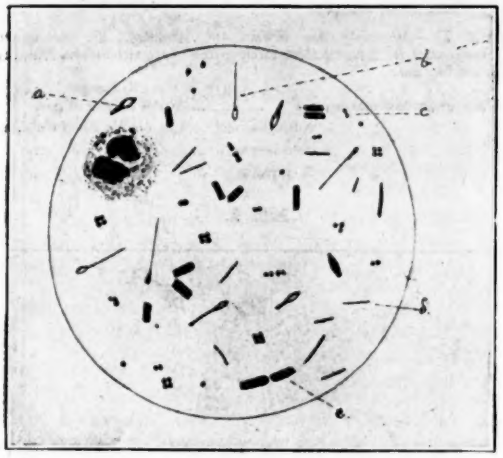
When material from the wounds was examined it was usual to find B. aerogenes and streptococcus with putrefactive spore-bearing organisms and frequently B. proteus. (Fig. 1.) If, however, the cultures were made from a portion of the gangrenous limb away from the wound, then B. aerogenes capsulatus alone or combined with streptococcus was the common finding.

On several occasions I examined films made from different portions of a limb amputated for gas gangrene and I found large numbers of B. aerogenes capsulatus in every plane from the skin to the bone marrow. They were especially numerous in the fascial planes between the muscles and in the subcutaneous tissue. Usually there was a fair amount of phagocytosis of these organisms, indicating an attempt at resistance to the infection, even after the limb had become gangrenous.

Description of B. Aerogenes Capsulatus.

This is a large, straight, non-motile anaerobic bacillus, with almost square ends. In the body it measures about $5\mu \times 2\mu$, but in culture the length varies enormously when different media are used. It is very strongly Gram-positive. Sometimes, both in material from the body and in serum culture, ordinary methods of staining show it to possess a very definite capsule (Fig. 2), but more often the capsule is not evident.

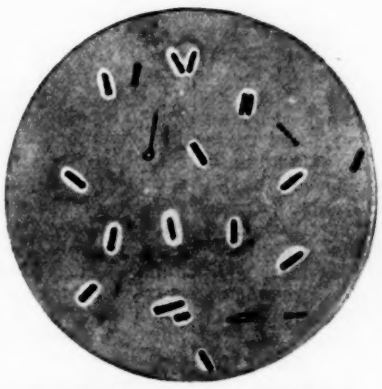
FIG. 1.



Film from wound in a case of gas gangrene. A, B. X. B, B. Y. C, Streptococcus. D, B. proteus. E, B. aerogenes capsulatus.

Spore formation.—In the body it forms spores which are, as a rule, situated near one end. The spores are large and oval, and distort the bacillus. Occasionally a median spore is seen. (Fig. 3.) In culture spores are only seen in special conditions; on sugar media they do not occur; in broth spores are occasionally seen; in cultures in blood serum they are usually to be found in very small numbers; and on neutral-red egg medium, although I could not detect spores microscopically, I found that a temperature of 80° C. for one hour would not sterilise cultures of more than two days' growth. Douglas found that if this bacillus is grown in undiluted human blood serum anaerobically with staphylococcus in two days very copious sporing occurs. By taking advantage of this one can easily separate B. aerogenes capsulatus from a culture containing non-sporing bacteria. The mixed culture is planted anaerobically with staphylococcus into human blood serum, and after two or three days the culture is heated to 80° C. for half an hour and planted into milk.

FIG. 2.



Film of fluid from vesicle on a gangrenous limb, showing B. aerogenes capsulatus, B. tetani, and streptococci.

Isolation from the body.—The easiest way is to boil a tube of sterile milk, and immediately while it is yet at a temperature close to 100° C. plant into it some of the pus. This kills the non-sporing bacteria, and (unless other spore-bearing bacilli were present) a pure culture of B. aerogenes capsulatus results. If other sporing bacteria are present then one has either to separate by plating or by planting into agar or glucose agar and drawing this up into a Vignal's tube. The separate colonies which develop can then be dealt with.

The anaerobicity of this organism is not very strict, and it was found quite sufficient to use tubes of milk containing about 10 c.c. and to incubate them without anaerobic precautions. The scum of cream which formed in such a tube was of considerable thickness, and apparently it shut off the air to a sufficient extent.

Cultural Characteristics.

Milk.—In from six hours upwards very firm clotting occurs with the evolution of much gas. This results in the formation of a tough, sponge-like, cheesy clot which rises to the surface by virtue of the contained gas bubbles. The fluid portion of the culture is watery in appearance and intensely acid. The bacilli are very constant in their size and appearance, and even in old cultures in which the bacilli have been dead for some time the appearance and staining reactions are preserved.

Blood serum undiluted.—In 24 hours there is a very copious growth, causing the serum to resemble milk in appearance. There is much gas formation. The serum becomes very acid.

Agar.—In stab or shake culture there is growth almost to the surface and much gas formation.

Glucose agar.—For surface colonies the anaerobic conditions have to be perfect. The colonies are small, round, semi-transparent, and only slightly raised.

Blood glucose agar (glucose agar with one-tenth part of blood added).—This is a very favourable medium for surface growth. The colonies were large, round, greyish, and very flat. The bacilli on this medium showed very long forms.

Neutral-red egg medium.—This is the best solid medium for surface growth of the bacillus. In 24 hours these colonies appear as bright pink spots about 2 mm. in size. They have a slightly raised margin and show a very characteristic prominence in their centre. The bacilli on this medium are very short and stout, many of them being little longer than they are broad.

Pathogenicity for guinea-pigs.—1 c.c. of a 24-hours' milk culture was injected into the hind leg of a guinea-pig subcutaneously. In 12 hours there was a swelling extending to the axilla on both sides. Death resulted in 24 hours. On

FIG. 3.

B. aerogenes capsulatus. Sporing forms observed in culture with staphylococcus in serum.

opening the animal it was found that the whole of the skin had been ripped off the underlying muscles by gas and a serous exudate. The muscles of the thigh and the pectoral muscles on both sides looked as if they had been dissected out, and were bathed in the sero-gaseous effusion. The internal organs were congested; the liver was a little larger than normal; the spleen was normal in size but very dark in colour. The bacillus could be seen in considerable numbers in the heart's blood and in smears from all the organs. The serous exudate in the subcutaneous tissue of the abdomen contained very large numbers of the bacilli, some of them showing sporing forms. 1/10 c.c. of culture in serum injected subcutaneously into guinea-pigs was usually fatal, but in one case there resulted intense œdema with gas formation in the subcutaneous tissues, which progressed for about 36 hours and then gradually disappeared. This was very remarkable, as the extent of the gas phlegmon and the extreme severity of the symptoms rendered the chances of recovery of the guinea-pig apparently hopeless. This guinea-pig by its complete recovery showed that even when the infection was far advanced an immunity may be developed which will overcome the infection.

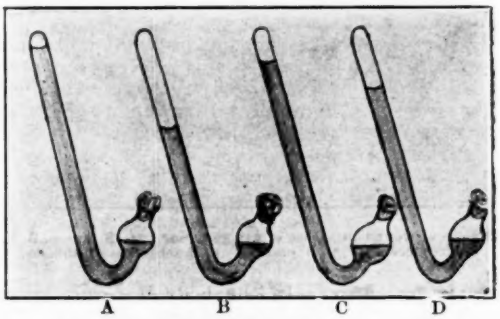
B. aerogenes capsulatus is an organism to which there exists in the blood serum normally a very considerable amount of opsonic substance, rendering the organism very easily capable of phagocytosis. It is usual, indeed, to see in the discharges from wounds this bacillus ingested by leucocytes. Possibly this, in part at least, accounts for the relative non-virulence of the bacillus. Its presence in almost all wounds has been demonstrated, but it is only comparatively seldom that it is seen to exercise its full pathogenic action, evidenced by the production of gas gangrene. In such cases there has nearly always been a very considerable amount of dead material or blood clot enclosed in the wound, which furnishes an admirable culture medium for the bacillus. When this bacillus grows on blood it produces a considerable amount of lactic acid, and it has been shown that lactic acid has a very potent action on leucocytes, preventing their emigration. Thus we have a vicious circle; the greater the growth of the bacillus the more is the production of lactic acid, and consequently the less is the leucocytic emigration. It can easily be seen, therefore, that unless such a vicious circle is broken the result is likely to be disastrous. The only efficient way to break it is by means of free drainage, thus diminishing the amount of culture medium for the bacillus and at the same time furnishing an adequate exit for the products of its growth.

It is rare, if not unknown, to see gas gangrene develop in a patient whose wound has been thoroughly opened up and drained. In this connexion it is interesting to note the effect of symbiosis of B. aerogenes capsulatus and other organisms. I have done a number of experiments in which I grew various mixtures of bacteria in human blood serum and watched the rate of growth as evidenced by the amount of gas formation. When staphylococcus was introduced with the bacillus the gas formation was noted much earlier than when the bacillus was grown pure, and at the end of 24 hours the amount of gas produced was much greater. The same thing, but to a lesser extent, was seen when streptococcus or B. proteus was added. We know that staphylococcus, streptococcus, and B. proteus are themselves incapable of producing gas in blood serum. Therefore the increased production must have been due to an increased activity of B. aerogenes capsulatus.

TABLE II.—*Showing the Effect of Growing B. Aerogenes Capsulatus in Association with other Organisms in Human Blood Serum.*

		24 hours.
1.	B. aerogenes capsulatus pure	Small bubble of gas.
2.	,, ,, + staphylococci ...	1 in. of tube filled with gas.
3.	,, ,, + streptococci ...	½ ,, ,, ,,
4.	,, ,, + B. proteus ...	½ ,, ,, ,,

FIG. 4.



Showing increase in gas formation when B. aerogenes capsulatus is grown with other organisms. A, B. aerogenes capsulatus pure. B, B. aerogenes capsulatus + staphylococcus. C, B. aerogenes capsulatus + streptococcus. D, B. aerogenes capsulatus + B. proteus.

This increase of growth of the gas-forming organisms by association with the common pyogenic bacteria is probably of great importance in the incidence of gas gangrene. The presence of, say, streptococcus aids B. aerogenes capsulatus to establish itself and to produce more rapidly substances which protect the bacillus from the counter attacks of the leucocytes, thus allowing it successfully to storm the defences of the tissues.

As regards the treatment of gas gangrene the main essential, both prophylactically and curatively, is free drainage. The progress of the disease is too rapid to allow of any curative vaccine treatment, but it is possible that if a vaccine of B. aerogenes capsulatus and streptococcus were injected very early (in exactly the same way as tetanus antitoxin) the temporary increase in immunity to these organisms would be sufficient in most cases, at any rate, to prevent the spread of the infection into the tissues. Large doses of B. aerogenes capsulatus vaccine (up to 1,000,000,000) can be injected without any reaction and without the development of any "negative phase"; so it would appear that such a vaccine would be perfectly safe to use, and I hope in the near future to see the use of such a vaccine justified by results.

BRISTOL ROYAL INFIRMARY.—The half-yearly meeting of the governors of this infirmary was held on August 10th, under the presidency of Sir George White. The medical report showed that there had been a decrease in the number of in-patients admitted on the civil side of the institution, but during the six months there have been about 2000 military in-patients, and there have never been less than 400 beds occupied in the civil and military sides of the infirmary. The out-patients numbered 21,269, compared with 17,475 for the corresponding period of 1914. It was stated that the total deficit on revenue amounts to £13,720, and adding the balance against the charity on the building account, which amounts to £22,904, there is at present a debt of £36,624 against the infirmary.

FURTHER OBSERVATIONS ON

THE BACTERIOLOGY OF THE PERITONEAL EXUDATE IN CASES OF PERFORATION OF THE STOMACH AND DUODENUM.

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AND
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IN the Erasmus Wilson lectures[1] of 1905 Dudgeon and Sargent gave the results of their investigations on the bacteriology of peritonitis. In the section devoted to the study of peritonitis dependent upon perforation of the stomach it is stated that a streptococcus—morphologically a streptodiplococcus—was present in cultivations from the edge of the ulcer in all cases, while from the peritoneal exudate it was found in four cases out of a total of seven examinations. They also found this organism in the pleural sac and in a subphrenic abscess following a perforated gastric ulcer from which this coccus had been isolated, and also in the pus from a perigastric abscess. This streptococcus was devoid of pathogenicity for mice and guinea-pigs. The only instance among this series of cases in which peritonitis was severe and which led to a fatal result the bacillus coli was present in addition to the streptococcus. In the four cases of perforation of a duodenal ulcer, however, no such organism was met with in the peritoneal exudate, but it was isolated from the edge of the ulcer in one instance.

Since these results were made known many similar investigations have been made by one of us (L. S. D.) on the bacteriology of peritonitis dependent upon perforation of the stomach and duodenum, but during the last 18 months a systematic investigation on 23 cases has been completed and forms the subject-matter of this communication. The total number of cases would be considerably increased if access was made to our records of spontaneous cases, but in our opinion a complete investigation on consecutive cases where every possible detail is considered is of far greater value.

Before proceeding to give a detailed result of our investigation it may be an advantage to refer to the studies of the distinguished American surgeon, Harvey Cushing, working in conjunction with the late Dr. Livingood. The results of these experiments were made known some 15 years ago, but it cannot be said that the importance of such work has been sufficiently realised. Harvey Cushing and Livingood contributed to the Science of Medicine—dedicated to William Welch by his pupils—a paper on the Bacteriology of the Upper Portion of the Alimentary Canal.[2] They made routine bacteriological examinations of the contents of the intestinal tract, more especially of the upper portion of the healthy intestine, as occasion occurred on the operating table, and conducted numerous experiments of a similar nature on the intestines of animals. Certain observations of special importance will be referred to in detail, and one in particular may be given as stated by them: "There would seem, therefore, to be a tendency on the part of the stomach to completely free itself, together with the end products of digestion, from even those micro-organisms which are resistant to the gastric juice; and consequently, to speak of the natural flora of the stomach is inappropriate, since in its natural empty state in health the viscus becomes amicrobic. ..... It is, I believe, dependent only upon interference with the stomach's power to completely expel its contents that bacterial life may persist in its lumen. The same principle holds true for the duodenum."

Of course, as these authors point out, an amicrobic gastric mucosa in ordinary circumstances of life is too good to be true owing to the frequency of meals which seldom permit the stomach to empty itself. Observations made by various workers referred to by Cushing and Livingood, on the intestinal contents, all tend to confirm that the number of micro-organisms in the digestive tract in health depends largely on the number introduced by the mouth. They show by bacteriological tests the frequency with which cocci, including streptococci, are cultivated from the duodenum of healthy dogs, and this final deduction, based on human and animal bacteriology, led them to emphasise the importance of approaching an amicrobic state in the intestinal tract by means of fasting or by the administration of sterile food previous to operations on the stomach and intestines. There is, of course, an important source of infection of the gastro-intestinal tract due more especially to streptococci, which is so common at the present day—oral sepsis. This subject is and has been referred to so often however in the consideration of almost every known disease that it is unnecessary to dwell further upon it here.

Bolton considers that the organisms which are found in the peritoneum in cases of perforation of the stomach are derived from the food and have caused infection of the base of the ulcer and peritoneum. This author found by experiment that when an ulcer is present in the stomach it may tend to spread if the pylorus is constricted and this extension of the ulceration he considers to be due to bacterial infection from the food, but if the mucosa was healthy no ulceration resulted except in some instances of complete stenosis of the pylorus.

We may now refer to the results of our investigation on the bacteriology of the peritoneal exudate in the 23 cases of perforation of the stomach and duodenum. The most important data are given in the accompanying table, and it will be seen that our list includes eight cases of perforation of the stomach in the immediate vicinity of the pylorus and two elsewhere in the stomach, while there are 13 instances of duodenal perforation mostly in the first portion.

It is unnecessary to give a detailed account of the bacteriological technique; it will suffice to mention that the peritoneal exudate was collected in sterile pipettes and transferred to sterile tubes which were sent to the laboratory for complete bacteriological investigation. In certain instances cultures were made direct from the edge of the perforated ulcer. Full detailed records were made of the condition within the peritoneum at the operation, and full clinical records were completed as far as was necessary. A point of considerable importance is that the actual collection of the

[1] The Bacteriology of Peritonitis, L. S. Dudgeon and P. W. G. Sargent, Erasmus Wilson lectures, Royal College of Surgeons of England, THE LANCET, vol. i., 1905, pp. 473, 548, and 617.

[2] Experimental and Surgical Notes upon the Bacteriology of the Upper Portion of the Alimentary Canal, with observations on the establishment there of an amicrobic state as a preliminary to operative procedures on the stomach and small intestine, by Harvey Cushing and Louis Livingood, Johns Hopkins Hospital Reports, vol. ix.

peritoneal exudate was made in nearly every case by one of us (B. C. M.) or under his direction at the time of the operation. To obtain satisfactory results ample peritoneal exudate [3] must be collected; platinum loops of exudate merely serve to increase the percentage of sterile fluids. In some cases bacteria will be found to be abundant in film preparations made from the infected peritoneum.

The actual result of the examination of films of the peritoneal exudate in our series of 23 cases showed absence of bacteria in 13 and a positive

Results of Investigation of Bacteriology of Peritoneal Exudate in 23 Cases of Perforation of the Stomach and Duodenum.

No. of case.	Site of lesion.	Interval between last meal and perforation: type of meal.	Result.	Bacteriological findings.
1	Perforated pyloric ulcer.	12 hours. Bread, tomato, cocoa.	Death on 11th day. Diffuse peritonitis; pulmonary tuberculosis.	1. Localised abscess around perforation; (*a*) Bacillus coli; (*b*) streptococci. 2. Free peritoneal exudate: sterile.
2	Perforated duodenal ulcer.	10 hours. Solid food.	Discharged.	1. Focus of ulceration: (*a*) Streptococci; (*b*) staphylococcus albus. 2. Free peritoneal exudate: (*a*) Streptococci; (*b*) staphylococcus albus.
3	,,	6 hours. (Vomited meal.)	Death on 3rd day from hæmorrhage.	1. Exudate around ulcer: Sterile. 2. Free peritoneal fluid: Sterile.
4	Perforated pyloric ulcer.	8 hours. Milk.	Discharged.	Free peritoneal exudate: Staphylococcus albus.
5	,,	4 hours. Bread and tea.	,,	Free peritoneal exudate: Staphylococcus albus.
6	Perforated duodenal ulcer.	4 hours. Solid food.	,,	1. Free peritoneal exudate: Streptococci. 2. From ulceration: Sterile.
7	,,	3 hours. Milk.	Death on 6th day; diffuse peritonitis.	Free peritoneal exudate: (1) Streptococci; (2) staphylococcus albus.
8	Perforated pyloric ulcer.	4 hours. Solid food.	Discharged.	Free peritoneal exudate: Sterile.
9	,,	4 hours. Solid food.	,,	Free peritoneal exudate: Streptococci.
10	Perforated duodenal ulcer.	3 hours. Solid food.	,,	Free peritoneal exudate: Streptococci.
11	,,	3 hours. Milk.	Death on 18th day. Diffuse peritonitis.	Free peritoneal exudate: (1) Streptococci; (2) staphylococcus albus.
12	,,	3 hours. Tea.	Discharged.	Free peritoneal exudate: Staphylococcus albus.
13	Perforated gastric ulcer.	1 hour. Light food.	,,	Free peritoneal exudate: Staphylococcus albus.
14	Perforated duodenal ulcer.	8 hours. Heavy meal of solid food.	,,	Free peritoneal exudate: Yellow diphtheroid bacillus.
15	,,	3 hours. Tea.	,,	Free peritoneal exudate: (1) Streptococci; (2) staphylococcus albus.
16	,,	4 hours. Tea.	,,	1. Exudate around ulceration: Staphylococcus albus. 2. Free peritoneal exudate: Staphylococcus albus.
17	,,	4 hours. Milk.	Death on 10th day; diffuse peritonitis.	Free peritoneal exudate: (1) Streptococci; (2) bacillus coli.
18	Perforated pyloric ulcer.	5 hours. Solid food.	Discharged.	Free peritoneal exudate: Streptococci
19	Perforated duodenal ulcer.	5 hours. Egg and milk.	,,	Free peritoneal exudate: Sterile.
20	,,	3 hours. Solid food.	Death on 8th day; diffuse peritonitis.	Free peritoneal fluid: (1) Streptococci; (2) Staphylococcus aureus; (3) staphylococcus albus. Similar result from peritoneal exudate obtained at the necropsy.
21	Perforated pyloric ulcer.	Immediately before. Solid food.	Discharged.	Free peritoneal fluid: Sterile.
22	,,	24 hours. Milk.	Died on 12th day; diffuse peritonitis.	Free peritoneal fluid: Sterile.
23	Perforated gastric ulcer.	4 hours. Solid food.	Discharged.	Free peritoneal fluid: Streptococci.

finding in 10, while of these 10 cases cocci represented as diplococci or streptococci were seen in each instance, and bacilli also in 2 cases which proved to be fatal.

The complete bacteriological findings may now be dealt with. In two cases the bacillus coli, together with streptococci, were cultivated from the peritoneal exudate. In a previous reference to the bacteriology of gastric perforation we stated that the only severe case of peritonitis which was fatal was infected with bacillus coli in addition to streptococci. The same result is now repeated, as both cases of infection of the peritoneum with the bacillus coli died about the tenth day from diffuse peritonitis. Similar records have been obtained by one of us (L. S. D.) on the bacteriology of cases of gastric and duodenal perforation in hospital and private, as the cases of bacillus coli infection of the peritoneum have been very severe or have terminated fatally.

Streptococci, however, have occurred more frequently than any other bacteria. On morphological grounds alone we should have no hesitation in defining this organism as a streptodiplococcus, as Dudgeon and Sargent did in 1905, but when each sample of peritoneal exudate was fully investigated it was found that two or more strains of such cocci were present. When we studied the morphology in the various media the streptodiplococcic arrangement was frequently met with, but not sufficient to warrant a separation from the streptococci. The same view is probably correct for the streptodiplococcus referred to in a previous communication, for although the morphological characters were distinctive yet they were insufficient for the purpose.

The morphological appearances are variable, as the chains may be long or short and the diplococcic arrangement may be obvious, indistinct, or absent. We will not dwell on the cultural characters of these streptococci in various sugars as no useful classification could be arrived at, although every

[3] In some cases we obtained an abundant growth of streptococci by incubating the pus alone, although no bacteria could be cultivated on the first occasion. Similar results were first noticed some few years ago at the time when one of us (L. S. D.) was investigating the subject of aggressins for his Croonian lectures. He noticed that important bacteriological findings could be obtained when the ordinary methods of inoculating artificial media were of no avail.

effort was directed towards the selection of individual colonies from plate cultivations. The acidification of litmus milk was a constant change, followed in nearly every instance by clotting more or less complete, while absence of hæmolysis of human red cells suspended in citrated broth was constant.

Numerous experiments were made to test the pathogenicity of these streptococci on rabbits, mice, and guinea-pigs. In some instances [4] massive doses were employed, such as the entire surface growth from two agar tubes which had been incubated for 24 hours at 37° C. That is a far greater quantity than could enter the tissues of a mouse or rabbit at any one period of infectivity. The clinical course of many of these cases of gastric and duodenal perforation, from which the streptococci were isolated, is sufficient evidence that these bacteria possess much less active pathogenicity for man in the majority of cases in comparison with many well-known types of streptococcic infection. It was thought that as the streptococci had gained entrance by the intestinal tract it might be possible to infect a rabbit by repeated injection, so as to excite an infection of the endocardium, and thus lend support to the view that endocarditis in man is related to the streptococci known to inhabit his intestinal tract. Whether the streptococci were injected alone on one or several occasions or together with the peritoneal exudate, the injection did not influence the result, as these streptococci were non-pathogenic for the animals mentioned above whatever method of inoculation was employed.

The only characters of these streptococci which may be referred to again at this period are the constant absence of pathogenicity to the lower animals and the absence of hæmolytic activity on human red cells. It was stated previously Dudgeon and Sargent isolated a streptococcus which they described as a streptodiplococcus on its morphological characters. They found such an organism in a total of 7 cases from the edge of the ulcer and from the peritoneal exudate in 4 out of 7 instances of gastric perforation. In no instance were they able, however, to isolate a streptococcus from the peritoneal exudate in duodenal perforation.

In the present investigations streptococci which on morphological grounds must be regarded as streptodiplococci have been isolated from the peritoneal exudate in 8 cases out of a total of 13, while with gastric perforations streptococci were cultivated on 4 occasions out of a total of 10.

As to the origin of these streptococci which infect the peritoneum in gastric and duodenal perforations, the most probable source of entry is by means of the food. We have already referred to the researches of Cushing and Livingood which resulted in the recommendation of bacteriological cleanliness as regards the food in gastric and duodenal cases. We know that such an ideal principle is seldom reached in this country, and, further, when we consider that milk, which is often the chief source of food in such cases, is probably our most polluted article of diet it can be readily understood that an amicrobic state of the stomach is never obtained. Streptococci and streptodiplococci are often found in milk in large numbers, so that those who prescribe a milk diet in chronic gastric cases should be careful to avoid milk heavily infected with bacteria. In the consideration of the result of the above cases from the point of view of peritoneal infection we have excluded Case 3, which died from hæmatemesis.

It is generally recognised that cases of gastric and duodenal perforation in which the period of time between perforation and operation is short have a much greater chance of recovery than those in which the peritoneum is exposed to infection for many hours. In the above series the average interval in the non-fatal cases was 13 hours and in the fatal cases 22 hours. Although this view is on the whole correct, yet it is by no means a rule to be relied upon. This is shown in our fatal cases, Nos. 1, 7, and 20, in which the interval between perforation and operation was nine, seven, and eight hours respectively. While in the non-fatal cases, Nos. 2, 15, and 21, the interval period amounted to 20, 20, and 25 hours respectively. A much more certain clinical guide in estimating the severity of the peritoneal infection, and therefore of formulating a prognosis, is the pulse-rate. The average pulse-rate in the fatal cases was 120 and in the non-fatal cases 100 per minute. Every case in which the pulse-rate was 120 or more died, except Case 4, and in this instance the patient was extremely ill for five weeks after the operation, with a temperature varying between 100° and 102°.

The actual size of the perforation does not appear to have any exact effect on the severity of the peritoneal infection.

The amount of free fluid in the peritoneal cavity is of undoubted importance, as it may be limited to the region of the perforation or may be widespread. In dealing with a small amount of free fluid in the peritoneum simple sponging in the region of the perforation was alone resorted to, but with a large amount of free fluid treatment by thorough irrigation with saline, without evisceration, was carried out. It may be mentioned here in connexion with the above treatment that no case of subphrenic or residual abscess occurred among this series of cases.

The abdominal wound in most of the above cases was sutured after the insertion of a drainage-tube down to the site of the perforation. The tube was inserted not for drainage of the peritoneal cavity, but so as to establish a track in the event of the gastric or duodenal sutures giving way, and was therefore removed about the third day.

[4] A detailed example can be quoted. A rabbit received intravenously 130 million young streptococci, followed by a second dose of 260 million, but no ill-effect occurred, either immediate or remote.

PRESENTATION TO A MEDICAL MAN. — On August 15th a presentation took place in the Town-hall, Dundee, on the occasion of the retirement of Dr. Robert Sinclair, one of the best-known medical practitioners in the city. The presentation took the shape of a massive silver tray and a cheque for £1000. The tray bears the following inscription:—"This tray, with a purse of sovereigns, was presented to Robert Sinclair, M.D., LL.D., J.P., by a large number of friends, on the occasion of his retirement from medical practice, in gratitude for his professional skill and in recognition of much public service. Dundee 10th August, 1915." Dr. Sinclair graduated at Glasgow University, and on leaving the University went in 1871 to Perth Infirmary as medical officer. Two years later he went to Dundee Infirmary as medical superintendent; thus for the last 42 years Dr. Sinclair has laboured in Dundee, where in addition to his medical practice he has done much for nursing reform, teaching of first aid, and helping to supply a motor ambulance to Dundee.

AN ATYPICAL EPIDEMIC, WITH A NOTE ON THE EVOLUTIONARY ETIOLOGICAL FACTORS IN DISEASE.

BY J. T. C. NASH, M.D.EDIN., D.P.H.CAMB.,
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THIS note on the evolutionary etiological factors in disease is based on a widely spread epidemic chiefly affecting children which was prevalent in Norfolk in the autumn and winter of 1914. The details may prove of interest in connexion with an annotation in THE LANCET of July 17th last. The chief characteristic of the Norfolk epidemic was sore-throat, not of a severe description. Cases seen by a medical practitioner had a moderate amount of fever, temperature 100° to 101·5° F., and generally a moderate pulse—100 to 120. In one small town 7 out of 13 cases (60 per cent.) had vomiting, but not always as an initial symptom. In 4 cases, or roughly 30 per cent., a pink erythematous rash was seen (generally affecting the trunk but not the face or limbs); in one other case it was seen on the elbows only. Two other cases had a papular rash. One girl, aged 9, who when seen by a medical man on Oct. 3rd had sore-throat and an indefinite papular rash, showed when I saw her (on Oct. 23rd) a discrete erythematous rash on the wrists and fingers; none elsewhere. She was suffering from cystitis, without albuminuria. The primary rash had apparently been urticarial in character, attended with itching and a swelled face. Another child who had sore-throat and vomiting on Sept. 27th had a distinct urticaria when seen by a medical man on Oct. 1st. When seen by me on Oct. 23rd there was a slight desquamation of the hands, but none observed elsewhere. (This child was being rubbed with eucalyptus oil which masked the character of the desquamation.) An older child in this family developed headache, vomiting, sore-throat, and rash on Oct. 8th, and when seen on the 23rd had desquamation similar to the other. A third child, aged 4, was sickening on that day (Oct. 23rd) with coryza and sore-throat, but had neither vomiting nor rash. Two children only out of the 13 showed on Oct. 23rd a "beefy" tongue with enlarged fungiform papillæ, somewhat suggestive of a late scarlet fever tongue. Besides the family of three noted above where there was some desquamation of the hand, these two children with "beefy" tongues were the only two of the other 10 affected, who, had they been seen independently of the others, would probably have been diagnosed as mild cases of scarlet fever; but even these lacked certain characters, such as high temperature and quick pulse at onset; and in one of the two sore-throat and rash were not noticed until the third day after the initial vomiting and headache. In neither case was a higher temperature than 101° noted, one had a pulse of 108, the other 120. On the 23rd, about a week after onset in each case, one showed no sign at all of desquamation, the other had a rough skin on the outer side of the forearm and a sore at one of the angles of the mouth. There was no history of illness among the adult members of infected families beyond a few cases of apparently ordinary catarrh. One child who had had scarlet fever four months previously had headache, vomiting, and moderate fever (with a geographical tongue) on Oct. 23rd, but no rash and only a slight sore-throat. Four of the 13 children when seen by me had slightly enlarged glands in the posterior triangle of the neck and two had palpable glands in the anterior triangle. The adenitis was in no case marked or acute.

In considering the above cases a diagnostician would be puzzled in deciding how they should be placed, the following being possibilities: (1) An aberrant form of scarlet fever, (2) rötheln or epidemic roseola, (3) Clement Dukes's fourth disease, (4) Dunn's (Hertford) disease, (5) influenza, and (6) a mild streptococcal septicæmia.

The elementary school in the town in which these cases occurred was closed at the time of my visit for a usual half-term holiday. When the school opened again on Oct. 28th I visited it to examine the registers and also any children returned to school who might have been ill during the previous four to six weeks. Two who had been away from school between four and five weeks through illness reported as sore-throat showed no signs of desquamation; one had an herpetic patch at one side of the oral orifice; a third, who had also been away about the same time, had nasal discharge and deafness, but no peeling. One child who had been absent for three weeks showed no signs at all.

Taking the class or standard which had been most affected, 1 child had been last at school on Sept. 11th, then 10 children were absent between the 23rd and 30th, 4 other children were absent between Oct. 7th and 9th, and 3 more on the 16th. These groups of absentees on certain dates appear to indicate an incubation period of 8 to 11 days, which is a longer period than for either scarlet fever or influenza and shorter than the usual incubation period in Dukes's "fourth disease" or rötheln (rubella).

Many may consider the evidence clear for rubella (rötheln), but personally I am in favour of the view that the outbreak was an evolutionary sport, and that evolution was tending on the lines of specific scarlatinal characteristics.

Fortunately the outbreak in this small town of 5000 population was not a thing absolutely apart but could be considered broadly with similar outbreaks in other districts. At a school just outside the boundaries of the city of Norwich, attended both by city and county children, cases of scarlet fever had been notified to the city medical officer and removed to the fever hospital from among the city children attending the school. On Oct. 14th I visited the school and inspected the children. Nothing definite was noticeable in the majority, but two children who had sore-throat on the 10th and 12th respectively had vomited on the 12th and 14th. There was no history of rash and the tongue was normal. The class-room was temporarily overcrowded, which would favour the spread of infection. On the 29th this school was again visited, when 6 children reported as having sore-throat on the 23rd were seen on their return to school. In no case was there a history of a rash, and they showed no sign of illness on the 29th. One child who had not returned to school was seen at home and found with severe sore-throat (non-membranous), enlarged inflamed cervical glands, fever (temperature 101·4°), but no rash. A swab taken from the throat revealed the presence of bacilli reported by the bacteriologist as Hofmann's. During the period between Oct. 14th and 24th one case had been notified as scarlet fever and removed to the isolation hospital. (Dr. H. C. Pattin, the medical superintendent of the city hospital, replied to my inquiry that he had no reason to question the diagnosis of scarlet fever in the cases admitted to the isolation hospital.)

Throughout the winter and the spring similar epidemic prevalence prevailed in numerous villages. Numerous swabs were submitted for bacteriological examination. From one village seven swabs were sent. Results: Streptococci, 4; Hofmann bacillus, 2; micrococcus catarrhalis, 4; Klebs-Löffler bacillus, 1. Nothing like Pfeiffer's influenza bacillus seemed to be present. From another village swabs from three children of one family with sore-throats all were stated to have cocci; two of them had a few Hofmann, and one a few Klebs-Löffler.

Bearing in mind the Hertfordshire outbreak described by Dr. R. A. Dunn,[1] which Dr. W. H. Hamer is inclined to think was of an influenzal nature, it may be well to recall that the first anomalous case recorded by Dr. Dunn was that of a girl with "peeling" hands who had had an irritable rash and sore-throat; but the history of the other case, and the character of the rash were thought to justify the rejection of scarlet fever. Then, in one family one member had what looked like scarlet fever, others had influenza, and one died from cerebro-spinal symptoms. Several "rash" cases resembled scarlet fever, and in some cases nephritis occurred. Generally inquiries showed a disease which was extensively prevalent in the East Herts district, attacking nearly every household—in this respect closely resembling influenza. Among members of the same family the majority were only slightly ill with catarrhal symptoms. Many had rash and other symptoms akin to those of scarlet fever, and a few developed irregular cerebro-spinal symptoms. In this outbreak the majority of cases were of an influenzal type, a large proportion of a scarlatiniform type, a few of cerebro-spinal type, and a very few of typhoidal type. Dr. Mervyn Gordon found micrococcus catarrhalis to be the predominant micro-organism in swabbings submitted for bacteriological examination.

In one village (Barford) in Norfolk I saw some cases in October, 1914, with Mr. G. E. Deacon, of Hethersett. At my request Mr. Deacon, who is a careful observer, kindly sent me the following notes:—

All cases except two occurred in children. One of the adult cases had a sudden onset with sore-throat and high fever. As the case developed it seemed identical with influenza. The other adult case seemed to be influenzal. Two of this patient's boys had at the same time sore-throats,

Anomalous Epidemic Disease (Autumn, 1914) in a Norfolk Town. Tabular Record of Symptoms and (where obtainable) Dates of Onset of Each, kindly supplied by Resident Practitioners.

Case.	Sex and age.	Headache.	Vomiting.	Sore-throat.	Rash.	Temperature (Fahr.).	Pulse.	Tongue.	Glands. A.	Glands. P.	Desquamation (Oct. 23).	Diarrhœa.	Coryza.	Remarks.
1	F., 13	+	+	+	—	101·5°	140		+		—			Sent home by school medical officer at end of September.
2	M., 8	—	—	+ Oct. 9.	—					+	—			
3	F., 3	?	—	+ Oct. 12.	+ Oct. 13.	101°								
4	F., 6	+ Oct. 15.	+ Oct. 16.	+ Oct. 18.	+ Oct. 18. on chest and abdomen.	101°	120	Beefy; enlarged papillæ. Oct. 23.		+	—			Tongue on Oct. 23rd suggestive of scarlet fever.
5	F., 10	+ Oct. 16.	+ Oct. 16.	+ Oct. 16.	+ Elbows only.	100·4°	108	Ditto.			Rough skin.		Sore at < of mouth.	On Oct. 23rd tongue suggestive of scarlet fever.
6	M., 10	+ Oct. 11.	+ Oct. 11.	+ Oct. 11.	+ Oct. 14.			Coated.			—			
7	F., child.	+ Oct. 23.	+ Oct. 23.	—	—			Geographical		+	—			Had scarlet fever in June.
8	F., child.	+ Oct. 16.	—	+	—	100°	Quick.		+		—			Neither tongue nor throat typical; glands very slight.
9	F., 11	—	—	—		102° Oct. 15.			—	—	—	+	+	
10	M., 6		+	+ Sept. 27.	+ (papular)				—	+	+ hands only.	+		Urticarial rash on Oct. 1st.
11	F., 14	+ Oct. 8.	+	+	+				—	—	+ hands only.	+		
12	F., 4	+ Oct. 23.	—	+	—				—	—				
13	F., 9	—	—	+ Oct. 3.	+ Indefinite Oct. 3				—	—	—			Irritable skin; swelled face; cystitis.

A = Anterior cervical. P = Posterior cervical.

enlarged submaxillary glands, and impetiginous sores. All cases were searched for rash but none found; in all the onset was acute but not sudden. The prominent symptom in all cases was rapid, painful, and tender enlargement of submaxillary glands. Sore-throats in all cases. No otitis media found. Three had yellowish nasal discharge which soon disappeared. About half the cases had impetiginous spots on face. Throats were all very red, slightly swollen with enlarged uvulæ; no vomiting at onset. The mother of one infected family developed during the children's illnesses facial erysipelas. Several of the affected children had signs of cold in the head.

Mr. Deacon added that for several years he had noticed—usually during November—"an epidemic form of sore-throat among children but very seldom affecting adults—onset sudden, temperature usually 100° to 103°, no vomiting, no rash, occasional otitis media, throat always very red, not much swollen, uvula long and pointed. After the fever had gone the face would be pale, the skin dry (no desquamation), and there would be decided weakness. Adults known to be particularly prone to influenza do not get this sore-throat when in contact with affected children."

[1] Brit. Med. Jour., August 25th, 1905.

Careful consideration of the symptoms here recorded will indicate that the cases fail to fall in with the required classical characteristics of definite scarlet fever, or rubella, or glandular fever, or influenza. The last term being applied frequently to protean manifestations, may most conveniently be the provisional place of the epidemic in nosology, but I cannot feel it satisfactory. The subsequent widespread incidence of cerebro-spinal fever in this country suggests some evolutionary relationship, and it is interesting to note that in Dunn's epidemic in East Herts (1906) some of the cases were of cerebro-spinal type. I venture to think this record may prove an interesting addendum to my little work on Evolution and Disease, which was reviewed in an editorial annotation in THE LANCET of July 17th last. My personal view is that the infection was not so much evolving for influenza as for scarlatina. Evidence supporting this is: (1) The disease chiefly affected children; (2) some cases were very like scarlet fever; (3) a mother of two children (Mr. Deacon's report) developed erysipelas [Dr. Longstaff showed the seasonal incidence curves of scarlet fever and of erysipelas were identical, and I have several times noted cases of erysipelas occurring among adults in families where children had scarlet fever]; and (4) the presence of streptococci, Hofmann bacilli, and in one case of Klebs-Löffler bacilli.

Norwich.

AN EPIDEMIC OF ACUTE HYDROCELE AND ORCHITIS IN BRITISH EAST AFRICA.

BY LUCIUS NICHOLLS, B.A., B.C., M.D. CANTAB.,
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THE condition of hydrocele and orchitis of the nature which I am about to describe is not mentioned in the standard text-books or works of reference, and probably is unrecorded. The patients were African porters who had been recruited in the Island of Zanzibar, and they were attached to the Carrier Corps of the East African Forces. There were 400 of these porters stationed at Kadjiado, which is on the Magadi branch line, about 300 miles from the coast and 5500 feet above sea-level. On Dec. 19th, 1914, eight porters suffering from this condition were admitted to the base hospital, and on the next day another four were sent in. The following three cases will serve in describing the disease, and respectively are typical of the three degrees of severity in which it afflicted the patients.

CASE 1 (No. 257).—The scrotum was greatly enlarged and hung as a pendulous mass, reaching 9 inches down the thighs from the pubes. The enlargement was noticeably greater on the right side. The subcutaneous tissue was œdematous; it pitted deeply on pressure. The patient complained of much pain, and this rendered a further examination of the parts impossible. So, as a diagnosis of hydrocele was made, a Southey's trocar was inserted into the sac and 9 ounces of turbid, blood-red fluid were drawn off into a sterile flask. The left side was tapped and 6 ounces of turbid fluid were withdrawn; this fluid was not even faintly ruddy; the diffused blood-red appearance of the fluid from the right side was due to hæmolysis of red blood corpuscles. After this procedure the right testicle was found to be enlarged to 2½ inches in its long diameter and to 2 inches in its transverse, and it was indurated and tender. Undoubtedly the epididymis was implicated in the enlargement. The spermatic cord was not thickened or tender to manipulation. There was slight enlargement of the left testicle, but it was not acutely tender. The patient was very ill; he was weak and distressed; his tongue was coated thickly with fur. The pulse was 110 beats per minute, and there was pyrexia ranging from 100 5° F. in the morning to 103° at night.

After the fluid had been removed from the left hydrocele the condition on this side rapidly improved. No more fluid collected and the testicle assumed natural dimensions, and the tenderness to handling disappeared. The right hydrocele again filled up and the patient complained that the pain in this region was increasing. When a week had elapsed since admission I decided to open the scrotal sac on this side. The patient was chloroformed and an incision made, when about 8 ounces of very turbid and semi-purulent fluid came from the hydrocele. The interior of the sac was rough with exuded and deposited lymph, the vessels were deeply engorged, and here and there were purple patches where hæmorrhages had taken place into the tissues. The testicle was delivered and opened; a dessertspoonful of creamy pus exuded through the incision, and finding that the testicle and epididymis were completely disorganised I removed them. A tube was left in the scrotum and for ten days after the operation there was a discharge from it. Eventually the patient made a good recovery, and there were reasons to believe that he did not lose the function of the remaining testicle.

CASE 2 (No. 1169).—The skin of the scrotum was very œdematous. There was a large hydrocele on the left side and a small one on the right side. That on the right side was tapped and when about 2 ounces of clear fluid had come away examination showed that the testicle was natural. Turbid fluid was withdrawn from the left hydrocele, and the testicle and epididymis were found to be enlarged to 2 in. in the long diameter and 1½ in. in the transverse; further they were indurated and tender. This hydrocele filled up in a few days, and during this time the patient had continued pyrexia of about 100·5° F. each evening. It was decided to operate. The patient was anæsthetised with chloroform and the scrotum was opened. When the hydrocele fluid had escaped the testicle was delivered through the wound and a small incision was made into it; a little turbid, blood-stained fluid exuded. The skin wound was closed and a small rubber tube was left in the scrotum. There was no more pyrexia, but a discharge came from the rubber tube for a few days. The enlargement of the testicle slowly subsided, but the organ remained indurated and did not return to its natural dimensions.

CASE 3 (No. 1130).—The scrotum was very œdematous. A condition of hydrocele was present on both sides, and after the fluid, which was very slightly turbid, had been drawn off, the right testicle was found to be a little enlarged and acutely tender. The left testicle was also tender, but was not enlarged. The patient was given fluid diet, and this, with rest in bed and fomentation, in a few days caused the disappearance of the orchitis. The fluid in the hydroceles reappeared a few days after tapping; therefore the operation for radical cure was performed on both sides, the sacs being turned inside out. The patient made an uninterrupted recovery and was discharged 11 days after the operation.

The 12 patients who were admitted to hospital could be classified as follows: 2 as in Case 1 were severely ill, and one testicle in each case was completely disorganised and therefore was removed; 3 cases showed similar severity to that described as Case 2; the remainder, 7, would be placed in the same class as Case 3.

After this outbreak 348 porters out of the original 400 were examined, and hydroceles were present in 38 of them; in 10 of them there were signs of a mild inflammation of one or other testicle. Thus among the same individuals who had been living and sleeping in close contiguity, 13·8 per cent. were suffering from hydroceles and 6·1 per cent. from orchitis. In the examination of the patients great care had been taken to exclude venereal disease.

Examination of the Fluid from the Hydroceles.

Smears were made on slides from the fluid of the patient in Case 1 and were examined microscopically. The films consisted almost entirely of pus cells. Streptococci were seen to be scantily distributed throughout films which had been stained with carbo-thionine blue; the organism was long-chained and the cocci appeared to be arranged in pairs in the chain. The result of Gram-staining of these films was peculiar, for it was difficult to decide whether or not the organisms were Gram-positive. An emulsion of staphylococci and B. typhosus was well shaken up with the hydrocele fluid and smears were made from the combined fluid and emulsion; thus the smears would contain the three organisms. They were stained by Gram's method and counterstained by safranine. The decolorising with alcohol was carried out in varying degrees, and the table below gives the result:—

—	Staph.	Strept.	B. typh.
1. Decolorising ceased while fresh alcohol still remained tinted with the stain	+	+	–
2. Decolorised until fresh alcohol ceased to be tinted with the stain	+	– + *	–
3. Decolorised for 3 minutes after the alcohol had ceased to be tinted ...	+	–	–

+ = Stained by Gram's method. – = Unstained by Gram.

* A few chains were coloured by the gentian violet, but most had taken only the counterstain.

Thus by Gram's method the streptococci in smears from the fluid were less easily decolorised than B. typhosus, but did not retain the stain so retentively as staphylococci.

The organism was investigated by cultural methods. From 9 of the 12 patients streptococci were grown which were of the same morphological appearance and gave the same tests. The organism in subcultures became more retentive of Gram's stain. When a broth culture was agitated and smears from this were stained it was found that the chains of cocci, almost without exception, were broken up into pairs. From this and its appearance in chains it is perhaps justifiable to call the organism a diplo-streptococcus, but the sugar and other tests produced the same result as when tested with streptococcus pyogenes. This table gives the result of the tests:—

Milk clot	–	Raffinose	–
Neutral red	–	Mannitol	–
Lactose	+	Salicin	–
Inulin	–	Hæmolysis	+
Cane sugar	+		

+ = Acid productions, &c. – = No change.

The streptococcus was undoubtedly the organism which had caused the orchitis and the acute illness among these patients. Many of the 400 porters showed signs of filariasis, and the blood of the 12 patients in hospital and 16 others who had hydroceles was examined. The blood was taken on three occasions—viz., at 9 in the evening, at 12 midnight, and at 2 in the morning. In 16 of these 28 cases microfilariæ nocturnæ were found. The conclusion is that filarial infection had caused the chronic hydroceles, and this prior infection had rendered the tissues of the patient liable to the attacks of other organisms, and the (diplo)-streptococcus, finding a favourable soil, had produced an epidemic of acute hydrocele and orchitis.

Undoubtedly there were other factors which contributed to the rise in virulence of the organism and the preparation of the soil. The porters had been huddled together in small railway carriages, and pending the extension of their lines they had been crowded closely in camp; also they had performed several marches carrying 50 lb. loads, and, indeed, this must have irritated a pendulous hydrocele.

Castellani, Madden, and others[1] have recorded a disease called "endemic funiculitis." The disease, though very different to the condition I have described, is caused apparently by a similar diplo-streptococcus.

TEMPORARY BLINDNESS FROM A PENETRATING BULLET WOUND OF THE OCCIPITAL LOBE.

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I BEG to submit for publication in THE LANCET (through the recognised Army channels) the following account of an interesting case of a bullet wound of the occipital lobe.

History.—Private —— (4th Gordons) was admitted to a base hospital on June 18th, 1915. He gave a history that at 5 A.M. on June 16th, whilst building up a trench, he was hit in the head by a bullet. He fell and at once was totally blind. He remembered being kept in the trench all day, vomiting frequently, and suffering from severe headache. He also remembered being carried from the trench and being in an ambulance, but had no further knowledge of events before his admission to the base hospital, though obviously he had been detained in a clearing hospital, as he was wearing hospital clothes.

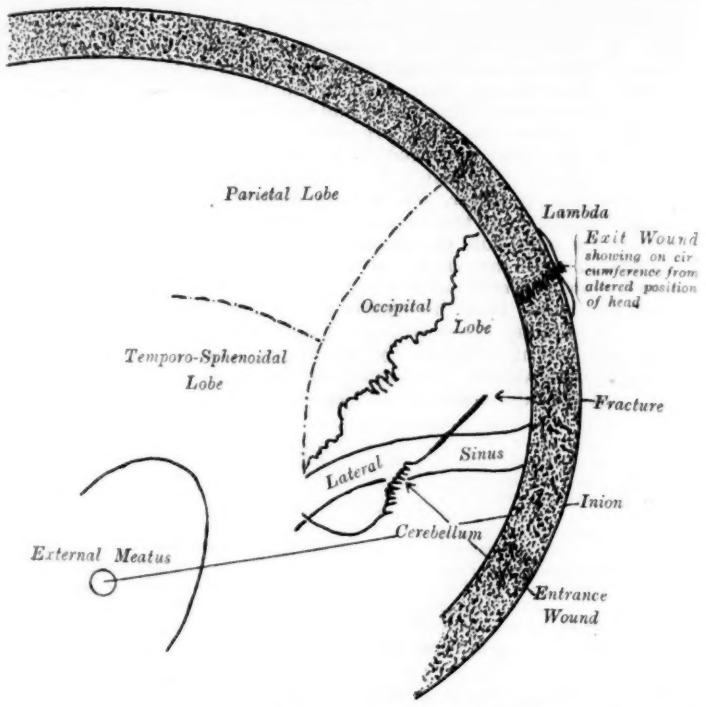
Condition on admission.—The patient was extremely drowsy, but perfectly sensible when roused. He was totally blind, being unable to tell day from night. Pulse, 44; temperature, 97·4° F. There was no motor paralysis, no interference with sphincters, and no alteration of reflexes. There was a small entrance wound 2½ in. from the inion on a line joining the inion to the left auditory meatus. The exit wound was 3 in. from the lambda on a line joining the lambda to the right auditory meatus. Both wounds were quite small and without any local inflammatory trouble. X ray photographs showed: 1. Left side.—A small elliptical puncture of the bone, in the same position as the scalp wound, and with a fissured fracture extending about an inch on each side of the puncture. (Fig. 1.) 2. Right side.—The exit wound showed as an irregular hole in the bone, about half an inch in diameter and corresponding in position with the wound in the scalp. Around the hole was a certain thinning of the bone, and a long fissure extended downwards in the lambdoidal suture and onwards through the occipital bone. (Fig. 2.)

Progress.—Operative interference was deemed unnecessary, and beyond preliminary purgation no treatment was given except complete rest and

[1] Castellani and Chambers, Tropical Medicine, p. 1429; THE LANCET July 4th, 1908; Coutts, THE LANCET, Jan. 23rd, 1909; Madden, Feb. 23rd 1907.

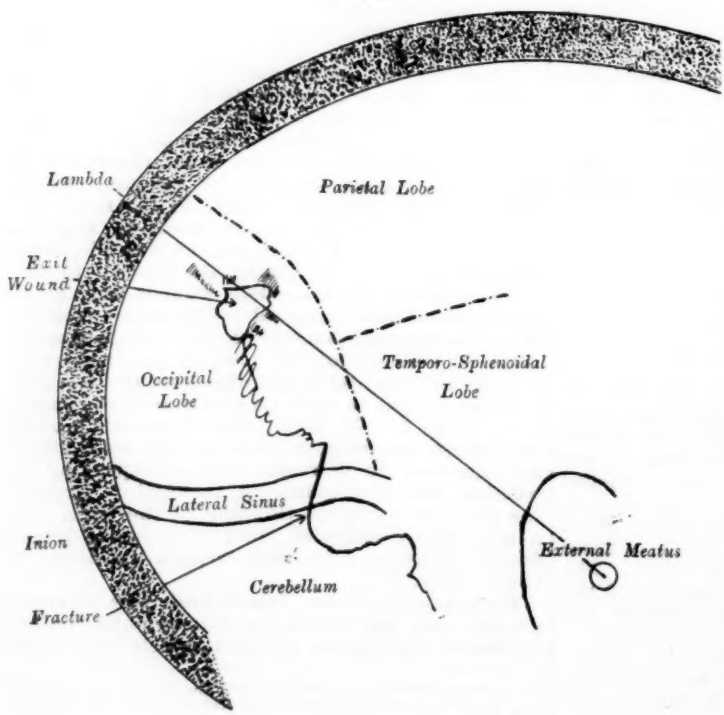
light diet. On June 20th, four days after being wounded, the patient could tell day from night. He was no longer drowsy, and the pulse was increasing in rate. Three days later he could distinguish large objects at a distance, but was unable to accommodate. On the tenth day he could count fingers, and on examination the optic discs were found to be normal. By the fifteenth day the patient was able to read ordinary print, but there was some limitation of the right field of vision. He was transferred to England on the twenty-second day, when his general condition was excellent, and his sight apparently normal. The temperature never exceeded 99°.

FIG. 1.



The two diagrams are tracings from two radiographs, with additional markings indicating the positions of the various cerebral lobes. From them it is clear that the bullet must have passed through the occipital lobe. It apparently entered just below the left lateral sinus and emerged from the upper part of the right occipital lobe, so that in its course it would pass through both occipital lobes. From the rapidity of recovery it is evident that blindness was due mainly to concussion, yet it seems extraordinary that a bullet could pass through both occipital lobes without causing some permanent interference with vision, as there must have been some destruction of brain matter.

FIG. 2.



The patient was never examined with a perimeter, but as far as could be determined by rougher methods, his fields of vision, including the fields for colours, were normal within three weeks from the time of injury.

The pulse-rate during his stay in hospital is instructive. If averages be taken for each period of three days, a steady rise is noticed. Thus for the first period of three days the rate was 53; second period, 58; third, 61; fourth, 67; fifth, 73; sixth, 79; and seventh, 84. This shows in the early stages a very definite slowing of the pulse from brain injury, though insufficient in itself to justify operation.

The completeness and rapidity of recovery in this case support the opinion, now becoming more general, that in many cases of gunshot wounds of the head operative measures should be delayed.

A NEW SIGN AND ITS VALUE IN THE DIAGNOSIS OF PULMONARY TUBERCLE.

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IT not infrequently happens that reference to the end of a treatise serves to illuminate its earlier pages. With this in mind the writer presents his conclusions, without apology, as the best introduction he can furnish to the succeeding text.

Conclusions.

1. In pulmonary tuberculosis characteristic bands of percussion impairment, of constant position, shape, and size are present over both lungs (see Fig. 1).

2. These are found, to skilled percussion, before any other sign of phthisis, in certain cases before symptoms, and persist throughout the course of the disease.

3. On account of their position they are liable when noted to be ascribed, wrongly, to the presence of tuberculous deposits in upper and lower lobes.

4. They depend, in fact, on no morbid structural changes, but are of reflex origin; though absent in health they can be produced by appropriate means in any normal chest.

5. Their persistent presence denotes an irritation (? always inflammation) of the lung parenchyma of some causation not necessarily tuberculous.

6. Incidentally they are of notable value in the diagnosis of phthisis. They will help to decide the presence or absence of a hidden focus in a case suspected of early tubercle, and they are useful in the exclusion of all catarrhal conditions not involving the lung parenchyma.

7. Their reflex nature serves to explain the occurrence, unintelligible on other grounds, of percussion impairment in the earliest stages of pulmonary tuberculosis.

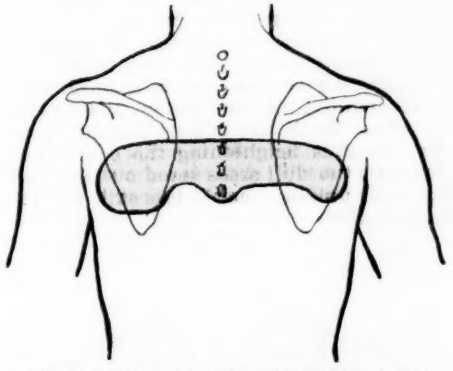
It must have seemed curious to many, as it has to the writer, that in all the years during which percussion has been utilised in the diagnosis of pulmonary tubercle no attempt appears to have been made to map out the shape, size, and position of the dull areas present. It may have been presumed, and the presumption would have been a natural one, that the areas of impairment vary in size, position, and shape according to the location and extent of the disease in the lung. Such a presumption was for a long time sufficient to satisfy the writer's own curiosity in the matter. Gradually, however, he found cause to wonder that the position of the areas of impairment over the upper and lower lobes behind fell so neatly always at the same level, and that they were nearly always demonstrable over both lungs, even in cases of quite early disease. This observation led him to map out these areas, and his wonder was increased to find surface figures of impairment of similar size, shape, and location on both sides of the chest in cases of phthisis at very various stages of disease. These areas he illustrated by a diagram in a short paper opening, on behalf of the Section of Children's Diseases, a discussion on Pulmonary Tuberculosis in Childhood at the meeting of the British Medical Association at Aberdeen in July, 1914.[1] The writer's object then was to demonstrate how different are the areas of percussion dullness due to enlargement of tracheo-bronchial glands from those characteristic of pulmonary tuberculosis. A similar diagram, showing the bands of impairment in phthisis, is here reproduced (Fig. 1) with a view of making further observations upon them—explaining so far as possible their nature, pointing out their significance, and indicating to what extent they are of value in the diagnosis of this disease.

[1] C. Riviere: Brit. Med. Jour., 1914, vol. ii., p. 463.

Statement of Case.

If any patient the subject of phthisis be placed in the usual attitude for medical examination with muscles relaxed, and by careful gentle percussion each back be examined from below upwards, areas of impairment or increased impairment will be found on both sides at certain levels. The lower area extends between the fifth and seventh dorsal spines, or sometimes a centimetre above or below this, and runs out as a peninsular over the scapular region (see Fig. 1); the upper area lies above the level marked by the interval between the spines of the first and second dorsal vertebræ.

FIG. 1.



To illustrate the upper and lower bands of impairment in pulmonary tuberculosis.

These areas of impairment, or of relative impairment, are more marked on the side of disease or of most advanced disease, and are still demonstrable as bands of increased dullness where the tuberculous process has spread over the whole side to the base. In many such cases they are obvious to quite coarse percussion, when they will almost certainly be taken as evidence of disease over the upper and lower apices considered so characteristic of pulmonary tuberculosis of adult type. They are, however, present in very early disease, before, indeed, any other lung signs are discoverable, and skilled percussion demonstrates that, even at this stage, they are to be found over both sides. They are absent in the normal chest (*vide* "Possible Causes of Error"), nor are they present in cases of simple bronchitis, bronchiectasis, or other conditions which do not involve the lung parenchyma.

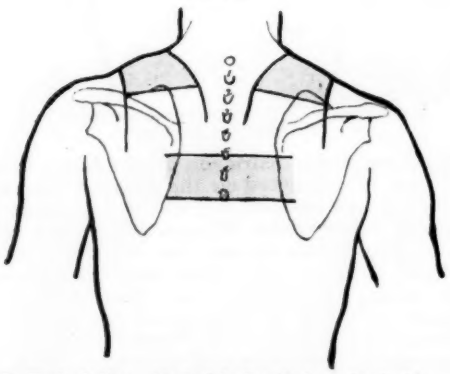
How to Find the Bands of Dullness.

Gentle percussion is needed for the recognition of these bands in cases of early disease—a change of pitch in the percussion note is by far the surest guide to their presence; the element of "expectation," so liable to delude the ear, must be rigidly excluded. Percussion should proceed from resonance to dullness, and the stroke be delivered with the right middle finger on a pleximeter finger (left index finger) pressed firmly on to the chest wall parallel to the dull area; when the lower limit of the band

has been found by percussion from below upward this should be marked with a skin pencil, and the upper limit looked for by percussion from above downwards towards it. In making these observations it must be borne in mind that an important change of percussion note occurs between inspiration and expiration in the normal chest, and to a somewhat lesser degree in phthisis, the note being lower-pitched and more resonant during the latter phase. If any difficulty is experienced on this account—and this is very likely to occur—the breathing should be arrested (without taking a forced inspiration) while percussion is proceeding. When the limits of the area have been pencilled the value of the observation should be checked by counting the vertebral spines down from the first dorsal (indicated by marking the upper limit of the lung resonance) to see whether the band obtained lies between the fifth and seventh spines or thereabouts, the level at which this lower dull area invariably falls.

With a view of making the presence of these areas more readily demonstrable to ordinary percussion the writer has tested many ways and means. He finds some help is supplied by the employment before percussion of vigorous skin stimulation of the back on the side to be examined. Smart rubbing with a piece of flannel or rubber, or less certainly spraying the skin with ethyl chloride, will usually increase the percussion resonance over the surrounding lung (for reasons to be mentioned later), while the bands of impairment remain as before. By thus heightening the contrast of percussion note the dull areas stand out more clearly, so that their presence needs less skill and practice for its detection.

FIG. 2.

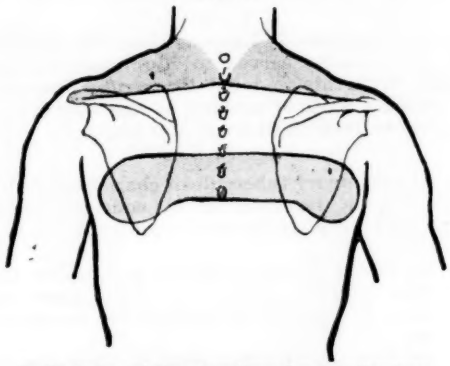


To illustrate the method of finding the lower band with the pleximeter finger laid across the spine, and the upper by following up Krönig's area of resonance till the line of impairment is reached.

In children the bands are most easily detected by percussion over both lungs at once, with the pleximeter finger laid right across the spine so as to cover the innermost end of each band of impairment (Fig. 2). Percussion then proceeds from below upwards till the lower border is found and marked, and then from above downwards to find the upper border. The same method is often convenient in adults also, but care must be taken where the vertebral spines are prominent, lest these press against the pleximeter finger and obscure the result by the introduction of bone conduction.

The apical area is best appreciated by percussion upwards with the pleximeter finger stretched across Krönig's area (Fig. 2) and pressed firmly against the chest wall. Normally the percussion note becomes lower and lower pitched as the top of the shoulder is ascended, but when the bands of impairment are present, a sudden rise of note occurs when the level of the first or second dorsal spine is reached. Either upper or lower area will suffice to decide the presence or absence of the sign here described, but for practical purposes the lower

FIG. 3.



To illustrate variations sometimes found in the shape and level of the lower band of impairment.

dorsal bands are perhaps the easiest to demonstrate—it is safest to test the presence of both upper and lower areas in any case of doubt or difficulty.

Nature of the Bands of Dullness.

The writer has already noted the surprise he experienced on discovering dull bands of similar size, shape, and position over both backs in cases of phthisis at all stages. It was obvious that disease could not run on lines so symmetrical and fixed—indeed where gross disease appeared the percussion changes it caused became superimposed on these figures of impairment already present at an earlier stage, but did not lead to their disappearance. At first it seemed likely that these areas might represent some interference by disease with lines of communication (bronchi, vessels, or lymphatics) deep in the lung, and thus reflect at the surface the presence of tuberculous foci at some deeper point. If this were the case it was clear that some anatomical explanation, in the distribution of vessels or bronchi in the lung, must be responsible for the shape and position of these areas, and just when it seemed that this was the region to explore the true explanation of the phenomenon was almost accidentally revealed. For the writer discovered that he was able to produce these areas of impairment at will in the healthy chest by measures already known to him as those causing the "lung reflex of contraction" originally described by Albert Abrams. Thus it appeared that these bands of dullness, so invariable a characteristic of pulmonary tubercle, were due to no structural morbid change, but depended on a reflex nervous phenomenon only.

Lung Reflex of Abrams.

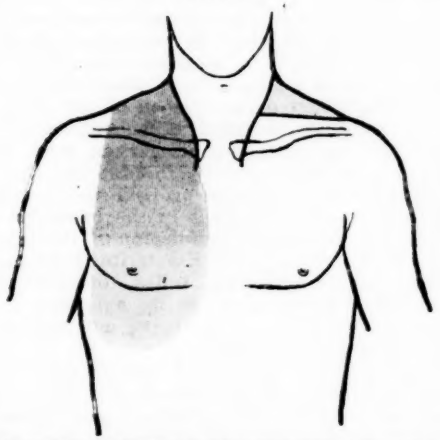
It was in 1903 that Albert Abrams [2] first described "the lung reflex of contraction" associated with his name; in the previous year he had published a paper on the "lung reflex of dilatation." He found that when the chest wall is violently concussed with a heavy mallet and pleximeter, a circumscribed lung contraction occurs adjacent to the area struck, and lasts for a few seconds (up to 20 sec., Abrams). This contraction revealed itself,

[2] A. Abrams: American Medicine, 1903, Jan. 3rd, pp. 11-15. Reprinted in The Blues, E. B. Treat and Co., New York, 1908.

according to his description, by impairment to percussion, by visibility to X rays, and by retraction of the lower lung border. He ascribed it to a contraction, through vagus stimulation, of longitudinal or dilator muscle fibres in the bronchial walls—fibres shown by Aufrecht to exist in certain animals. Roy and Brown[3] had already demonstrated the presence of dilator nerve-paths in the human vagus, and this fact has been more recently confirmed by Dixon and Brodie.[4] Abrams showed in subsequent communications that his reflex of contraction could be obtained by other means than by local percussion—by concussion or sinusoidal stimulation over certain vertebral spines, by stimulation of the vagus nerve in the neck, by the use of certain nasal irritants, and by the administration of certain drugs.

These important discoveries of Abrams are for the most part readily confirmed (the writer has not found the reflex visible to X rays); there remain, however, certain points in the phenomenon itself which escaped the observation of the discoverer, but which will be readily appreciable to those who

FIG. 4.



The percussion changes front and back produced by concussion of the chest wall below the right clavicle (Abrams's reflex). The inner line of Krönig's apical resonance is marked out in front.

practise gentle percussion. 1. Not only does percussion impairment appear at the point of concussion, as Abrams demonstrated, and spread thence over the chest wall, but there arise over both backs, first developed on the concussed side, double bands of impairment similar to those always present in phthisis and illustrated in Fig. 1. 2. The reflex can be shown to last, not a few seconds only as Abrams affirmed, but for some ten minutes at least to gentle percussion.

The Reflex in Health and Disease.

We find, then, that in the healthy chest heavy percussion, below one clavicle for example, will produce the following changes: In front, impairment over the whole side, most marked at the point struck (Fig. 4); behind, the bands of impairment already described (Fig. 1). In the earliest stages of phthisis we find, as already explained, bands of impairment over both backs of precisely similar position, size, and shape to those obtained by concussion. It remains to remark that in front a widespread impairment similar to that produced by concussion is very commonly present in quite early tuberculous disease, and it is tempting to believe that this also owns a similar explanation—that it is, in fact, of reflex origin just as are the posterior dull areas. For otherwise the extent of this area of impairment with incipient disease will still remain as inexplicable as it has done in the past.

The Early Percussion Changes of Phthisis.

For many years past a difference of opinion has existed as to the relative value of percussion and auscultation in the detection of the earliest stages of pulmonary tuberculosis. The opposing claims have been defended, for the most part, from widely different standpoints. The champions of percussion, in nearly all cases the exponents of gentle percussion, have opposed experience to mere theory; they have recorded the fact that, to their percussion, changes were discoverable in the very earliest stages of phthisis, in many cases before any changes were detectable to the stethoscope. Their opponents have met this appeal to experience by the retort that in really early disease no lung changes *could* be present which would be detectable by percussion, and this argument, which indeed has seemed up till now a weighty one, has appeared quite irrefutable to many.

The writer has been one of those who in the past have recognised and recorded the striking percussion changes of early phthisis without being able either to explain their nature or, indeed, to meet the weighty *non possumus* argument against them. In a volume[5] written some two years ago he expressed his conviction that "some change of resonance to gentle percussion accompanies very early lesions at the apex," that "some alteration to skilled percussion can be found over every diagnosable lesion, and that a diagnosis of phthisis can rarely or never be made without it." In the same volume he expressed surprise at the apparent discrepancy between the area of impairment and the amount of disease as follows: "In practice it is found that impairment in the earliest stages of phthisis, though slight in degree, is by no means narrow in extent; and the reason of this is, in the writer's opinion, not always easy of explanation. Changes of air and blood content in surface layers are, as indicated above, doubtless important factors; pleurisy is probably a frequent cause. ..... Certainly in practice it is not uncommon to find slight impairment reaching right to the base in early stages, a distribution which, with failure of auscultatory changes, is very significant of pleural disease. There remains the possibility, not hitherto suggested, that spasm of muscle over the affected side may be an occasional factor." So much for impairment in general, and that over the front of the chest in particular; over the back the writer was content to recognise and describe impairment over upper and lower apices, the "seats of election," and regarded such impairment as characteristic of phthisis, and at that time as evidence of the presence of tuberculous deposits in these areas.

A reference to Fig. 4 makes clear, in the writer's view, many points which before were difficult or impossible of explanation, for this diagram stands equally well, *qua* percussion signs, for either of two conditions—for the lung reflex obtained by percussion of the chest wall in the healthy, or for a characteristic case of early tuberculous deposit in the lung on the same side. The percussion signs in both cases are identical and, in the writer's opinion, they are attributable to the same cause—

[3] C. S. Roy and G. Brown: Proceedings of Physiological Society, 1885, May 10th, p. xxi. (Journal of Physiology, 1885, vol. vi.).
[4] W. H. Dixon and T. G. Brodie: Journal of Physiology, 1903, vol. xxix., p. 97.
[5] C. Riviere: The Early Diagnosis of Tubercle, Frowde and Hodder and Stoughton, 1914, pp. 20–29.

namely, the presence of a "lung reflex of contraction" in both. In the one the reflex is of necessity a passing phenomenon; in the other it remains so long as its causation, an inflammatory irritation of the lung parenchyma, supplies the necessary stimulus. In this fact, in this reflex percussion change lies the key, in the writer's opinion, to the early impairment of phthisis, and with it goes ample justification of the upholders of percussion in the early diagnosis of this disease. At the same time there is removed a serious source of error—it can no longer be held that impairment over the lower lobe or opposite lung in these situations is any evidence of the presence of underlying foci of disease.

Impairment Due to Lung or Thoracic Muscles?

It is obvious that the reflex phenomena described exhibit themselves through the action of muscle either in the substance of the lung or in the chest wall. That spasm of thoracic muscle could give rise to these bands of impairment is improbable for various reasons. Firstly, the shape of the bands evidently does not follow the lines of muscular distribution over the back, nor can it be supposed that a segmental stimulation can influence zones of muscle as it does zones of skin. Moreover, above the clavicle the edge of impairment extends quite definitely below the prominent edge of the trapezius muscle on the shoulder (Fig. 4), an unlikely landmark if muscle were involved. On the other hand, it might well be argued that if the reflex is of pulmonary explanation the bands of dullness should disappear over an artificial pneumothorax. As a matter of fact, they are usually greatly diminished but they are not altogether lost. Possibly the continued presence of the collapsed lung along the back near the spine may serve as some explanation of this anomaly; over the functioning lung the bands are often more strongly marked than usual. In addition it should be possible to abolish the reflex by atropine if it is, as seems probable, of vagus origin, but in four phthisis patients who received gr. 1/60 subcutaneously and displayed the usual cardiac acceleration the bands of impairment persisted and showed no recognisable change.

With regard to the lung reflex obtained artificially strong evidence in favour of its pulmonary origin exists in the quite definite retraction, of some two or more centimetres extent, which occurs at the base of both lungs. This, if it occurs also in phthisis, may possible afford some explanation of Williams's diaphragmatic phenomenon of hitherto uncertain explanation. The writer has not been able to detect any change in the size of Krönig's apical resonance as a result of the production of the lung reflex of contraction.

Value of the Sign in Diagnosis.

We may now turn to the practical points suggested by the presence of these characteristic bands of impairment, and first as to their significance.

Significance.—They are present, as already noted, in cases of phthisis at all stages, with certain exceptions, to be presently noted. They are present, though difficult to find, in the broncho-pneumonias of childhood. They are absent in simple bronchitis, most cases of bronchiectasis, limited disease of the tracheo-bronchial glands; in all cases, indeed, where no marked irritation of the lung parenchyma is occurring. Their presence, then, points to an irritation (? always inflammation) of the lung parenchyma, of whatever causation, for certainly there can be nothing "specific" about a reflex phenomenon. Nevertheless, the value of this sign in cases of doubtful pulmonary tuberculosis is very real, since in practice the differential diagnosis generally lies between this disease and some condition where the lung parenchyma is not involved.

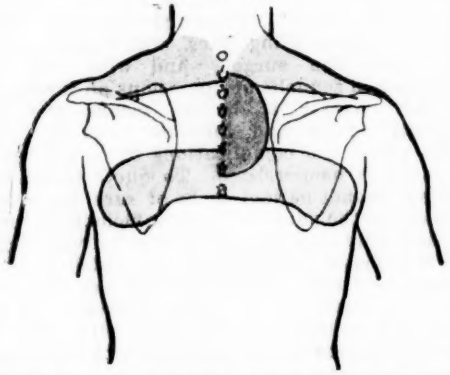
Possible causes of error.—Since the value of a sign in diagnosis is directly dependent in the consistency of the evidence given by its presence or absence, it will be relevant to consider here what fallacies may arise to cloud the issue in the case of the lung reflex. The reflex is absent, as already stated, in the healthy chest, but it may be readily produced by certain apparently innocent manœuvres, and thus give rise to error. "A further reason for the avoidance of heavy percussion in the detection of phthisis," observed the writer in a former publication, "is the possible production in the lung of an artificial impairment by the lung reflex of contraction of Abrams." But even light percussion of the chest will cause a certain grade of reflex change, particularly in the upper area, and especially in children and the young, and this may cause doubt and confusion in those whose ear is delicately tuned to slight changes of percussion note. For this reason it is safest to examine the back first in all cases and to decide on the presence or absence of the reflex bands before any percussion of the front of the chest is attempted. It is best in cases of doubt to establish the presence or absence of this sign on more than one occasion, but if concussion or percussion of the chest wall can be certainly excluded other sources of error appear to be unimportant. It is true that a stretching of the vagus by forcible bending back of the head will at once provoke the reflex, but this is an unlikely accident in the examination of a chest for phthisis. Stimulation of the vagus by swallowing will not, in the writer's experience, produce a recognisable reflex of contraction. Stimulation of the skin, as by exposure to cold or by friction only tends to bring out the opposite reflex of lung expansion.

Other possible causes of error—and further experience may perhaps extend the list—may be stated as follows. The change of percussion note between inspiration and expiration has already been referred to, and this is especially a source of difficulty in children where the breathing cannot be arrested. In older people it is generally best to carry out the examination with the breath held. The writer has found the reflex present in a few cases of nasal disease where no other explanation of its presence was forthcoming. On the other hand, in a few cases of acute or advanced pulmonary tuberculosis, where the power of reaction appeared to have failed, the writer has found the bands of impairment of feeble development or altogether absent. From the point of view of diagnosis this failure was of no great importance, since the cases were readily diagnosable on other grounds. From the side of prognosis the fact might prove of value in the estimation of the type of disease likely to develop in a case under consideration.

Conditions where the reflex may be of practical value.—If the possible sources of error enumerated above are carefully eliminated or discounted the reflex sign will supply information of considerable utility in the diagnosis of pulmonary tuberculosis. (*a*) It will draw attention to the presence of a hidden lung focus long before this becomes apparent to other clinical methods of investigation, and even accidentally before symptoms are present. On the other hand, and equally of importance, its absence will probably enable the physician definitely to exclude the presence of a focus of active tubercle

—otherwise a well-nigh impossible task. (*b*) The absence or presence of the reflex will help to settle the question whether an apical catarrh or apical collapse is of merely bronchitic origin, or includes a broncho-pneumonic process of probable tuberculous nature. (*c*) It will help to decide the vexed question when arrested disease has passed on to the stage of definite cure. The writer has watched cases of arrest where the reflex persisted up to two years. On the other hand, he has found the bands of impairment disappear in cases of cured disease. This test of arrested *versus* cured disease may be expected to be of value in the decision of when to cease refills in cases of artificial pneumothorax. In a case of the writer's where refills had been continued for 5½ years, and the patient had been during this time practically free from symptoms, the reflex still remained markedly present. The inference that disease was not cured, to which this led, has been recently justified by the occurrence of a fresh hæmoptysis. (*d*) It will help to decide the question whether lung changes, accidentally discovered, are those of old and cured disease, or are due to an active process which has not yet led to recognisable symptoms. (*e*) The reflex is present in most cases of pleurisy, with or without effusion, and points, in all probability, to the presence of an underlying pulmonary lesion.

FIG. 5.



To illustrate the areas of impairment found in cases of tuberculous tracheo-bronchial glands with a spread of disease into the lung.

This is, however, a matter which requires prolonged investigation before proof can be established, and the writer at present keeps an open mind as to whether a pleural inflammation alone is or is not capable of setting up the lung reflex. (*f*) It is present in cases of asthma and bronchitis where a chronic peribronchial inflammation (whether of tuberculous origin or not) is proceeding and appears responsible for some of the symptoms. (*g*) In most cases of disease of the tracheo-bronchial glands in children characterised by right interscapular impairment this lung reflex is, as already remarked, absent. In a proportion, however, it is present, and appears to indicate in these cases a decided spread from the diseased glands into the lung parenchyma. (Fig. 5.) (*h*) The sign is somewhat difficult to determine in young children and is, *qud* tuberculosis, of much less value than at later ages, since protracted broncho-pneumonias of other causation than tubercle are comparatively common. In other children its value and interpretation are somewhat similar to that in adults, with due attention to the unfortunate ease with which it is set up artificially.

The Case for Percussion.

This paper has been headed "A New Sign," partly in submission to that considerable body of medical opinion which has hitherto failed to recognise, or at least refused to admit, the occurrence of percussion changes in the earliest stages of phthisis, partly, perhaps, with intent to stimulate interest in a useful diagnostic point. But, these reasons apart, there remains in the peculiar nature of the phenomenon described ample justification of the claim to designate it a "sign," and in the province of disease a new one. Nevertheless, the writer is aware that the matter might have been approached, with certain advantages, from a different point of view, and some such title as "The characteristic percussion changes" or "The early percussion changes of phthisis, and their reflex nature" occurred to him as in many ways suitable, but for certain obvious disadvantages. For the former takes no account of the fact that these changes are not characteristic of phthisis to the exclusion of lung inflammation of other causation, while the latter would but partly cover a sign which is not confined to early disease but is present in phthisis at all stages. Even so the latter heading would have proved a strong temptation to the writer if he could have felt that these changes had received any general recognition up to the present, and that their explanation was awaited with any degree of interest. For the writer's desire has been at least as much to justify the exponents of gentle percussion as to establish a new sign in the realm of pulmonary disease. His thesis in its broad lines aims at establishing in particular the following points: That the earliest signs obtainable in cases of pulmonary tuberculosis are those which fall under the heading of percussion changes; that these changes are of characteristic position, shape, and size, and that they are of reflex origin; that they are in no way "specific" or peculiar to tubercle, but are evidence of an inflammation of the lung parenchyma; that they bear no relation to the distribution of the pulmonary lesions save by indicating the side of disease or of most advanced disease and, in the case of an early focus, its level in the lung to a rough extent. Here are no extravagant claims for percussion, for its strict limitations are clearly set forth; percussion, *par excellence*, for early or provisional diagnosis—that is the extent of the claim. There remains to auscultation the rest of the field unchallenged—full responsibility for the estimation of the position, extent, and amount of activity of the further stages of tubercle in the lungs so far as these are appreciable from the surface of the chest.

In introducing these characteristic percussion signs to the notice of the profession the writer is under no delusion as to the amount of confirmation they are likely to receive. Fortunately, it is open to anyone at once to satisfy himself of his ability to employ them in the diagnosis of chest disease. A normal chest heavily percussed below one clavicle supplies at once the exact signs present permanently in nearly every case of early phthisis. Whether the observer will be able to recognise these changes, so valuable when learnt, will depend on the time and attention he has been able to bestow on the art of percussion: (1) On his proficiency in gentle percussion, and the recognition that it is always relative changes of notes he is concerned with—the careful comparison of one area against another; and (2) on his musical ear, which must detect differences of pitch, and must rely on these solely in the decision of relative resonance or impairment.

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Reviews and Notices of Books.

Symbiogenesis, the Universal Law of Progressive Evolution.

By HERMANN REINHEIMER. London: Knapp, Drewett, and Sons, Limited. 1915. Pp. 425. Price 10*s.* 6*d.* net.

ACCORDING to the author, the favourable reception accorded to his "Evolution by Coöperation" in 1913 has encouraged him to come forward with a still greater effort towards the elucidation of the laws of natural coöperation and a more precise formulation of fundamentally important bio-economic principles. He also tells us that he has spent 18 months of almost uninterrupted daily labour in compiling the present volume, "after weighing the leading propositions now for a considerable number of years."

The subject-matter is dealt with under the following eight headings:—Symbiosis, Bio-dynamics, Genetics, Bionomics, Pathogenesis, Orthogenesis, Psychogenesis, and Science and Democracy. The author considers "the great principle underlying all Creative Life, all Progressive Evolution, to be that of 'Symbiogenesis'—i.e., the mutual production and symbiotic utilisation of biological values by the united and correlated efforts of organisms of all descriptions." We are also told that "eating is a mode of love precisely in so far as it is an instrument of symbiogenesis." Under Symbiosis there is an account and much criticism of work done on plant-animals, more especially as this is set forth by Keble. For the author nutrition is a dominant factor in the process of evolution. Under the heading "Bio-dynamics" the question of biological origin is dealt with in detail. The chief determining dynamic factors are economic, and these determine the biochemical factors, and the author seeks to show that the dynamics of organic growth are identical or parallel with those of mercantile growth—i.e., they depend on activity, accumulation, and exchange of services. The chapter on Genetics is interesting, and in it the author has collected much detail and attempts to show that Mendelian ratios and phenomena are understandable in the light of symbiogenesis. Under Bionomics there is again a large collection of data, astute comparisons, and suggestive speculation. Diseases and defence of the body are dealt with under Pathogenesis. Anaphylaxis, the danger of sensitising animals, immunity, toxigenesis, and the high value of "love foods" are some of the subjects discussed. Orthogenesis is meant to include progressive variation along a definite line, but it requires symbiogenesis to explain and complement it. Even psychogenesis, or mental evolution, is dependent on symbiogenesis, while ideas are like organisms in that they have an interdependent existence and grow by symbiotic endeavour. Throughout the work there is much interesting comment on the Darwinian theory, and the views of Hering, Butler, Huxley, and Herbert Spencer.

This work will be read with interest by many biologists, whether they treat respectfully or otherwise the author's estimate of the factors which he groups under the heading of "Symbiogenesis," and which he claims to comprise universal law of progressive evolution.

The Tonsils—Faucial, Lingual, and Pharyngeal—with some Account of the Posterior and Lateral Pharyngeal Nodules.

By HARRY A. BARNES, M.D., Instructor in Laryngology, Harvard Medical School. London: Henry Kimpton. Glasgow: Alexander Stenhouse. 1914. Pp. 168. Price 12*s.* 6*d.* net.

THE tonsils during the past few years have been a favourite theme for discussion at medical congresses and societies, and have held a correspondingly prominent place in the periodical medical press. The discussions have been mainly concerned with the various methods of the complete removal of the tonsil in the capsule, with the result that the scientific facts concerning the lymphoid tissues of the throat, facts upon which any theories of surgical measures must be based, have received inadequate attention. Dr. H. A. Barnes's book on the tonsils places these facts in a concise form.

The arrangement of the book displays a commendable sense of proportion. The subject is dealt with in ten chapters. The first eight are devoted to a consideration of the general nature of lymphoid tissue, to a description of the development, anatomy, and histology of the tonsils, to an account of the function, general pathology, and bacteriology of the tonsils and their relation to systemic infections, and to the diseases and neoplasms of the tonsils. These eight chapters lead up to the two concluding ones, which deal respectively with the surgery and with the complications and sequelæ of operations on the tonsils. The last chapter is by no means the least important. First and foremost, and the most serious of all the complications of operations on the tonsils, is hæmorrhage. To quote the author: "While it cannot be said to be of rare occurrence, especially in the adult, it is not sufficiently common to be seriously apprehended in the individual case. Even if it does occur, the cases in which it cannot be absolutely and easily controlled are extremely rare. The statement is made advisedly. It presupposes a number of conditions—first, that the patient is not hæmophilic; second, that the operation is done by a careful and competent throat surgeon and not by a general practitioner of medicine; and third, that the patient is in a hospital and that he remains there for at least 24 hours after the operation. If all these conditions are present, and they always should be, the chances of fatal result ensuing from this cause are so slight as almost to be a negligible factor." Now that the partial operation of tonsillotomy has to a large extent been superseded by the radical operation of tonsillectomy another complication met with is post-operative deformities. "Careless or incompetent operating may be followed by almost any degree of deformity of the palate and the faucial pillars, from loss of the uvula to conditions which only specific adhesions and contractions can duplicate." Dr. Barnes seems to have a poor opinion of the surgical standards of the American general practitioner.

The book lays no claim to having settled any of the mooted questions from time to time under discussion, but the more strictly scientific parts have been written with a view to emphasise their practical application to clinical work. It is clearly written and well illustrated with 39 plates of original drawings and photomicrographs. The typography and printing are good.

Case Histories in Pediatrics.

By JOHN LOVETT MORSE, A.M., M.D. Second edition. Illustrated. Boston: W. M. Leonard. 1913. Pp. 639.

IN THE LANCET of August 19th, 1911, we published a review of the first edition of this work, and criticised the arrangement and purport of these case histories. In his preface to this, the second, edition the author makes answer to the objections which we then raised.

The chief faults as it appeared to us in the general design of these collected cases, and indeed as it appears to us now, inasmuch as little alteration has been introduced, are that the book does not well serve the purposes of a work of reference owing to its inherent defects in arrangement and because of its incompleteness; and, further, that it cannot take the place of post-graduate lectures, either oral or printed, owing to the monotonous sequence of the histories. We are now, however, given to understand that the main object of the book is to serve not so much as a work of reference, nor as a book which could afford the same sort of light reading as is usually to be found in published lectures, as to present a series of problems to be solved by the reader. For the benefit of those of our readers who have not seen Dr. Morse's book we may explain that its pages are occupied by accounts of some 200 cases arranged in 14 independent groups, these groups comprising (1) diseases of the new-born; (2) diseases of the gastro-enteric tract; (3) diseases of nutrition; (4) infective diseases; and so on throughout the series in accordance with the classification generally adopted in works on pædiatrics. Each section, with one exception, commences abruptly with a case, to which in due order a number is attached. For instance, taking Section IV. as an illustration, we note as a heading that this section covers "Diseases of Nutrition," and that the first case is numbered "56." Then follow a few general notes, such as might be supplied by the practitioner in charge of the case; this is succeeded by a description of the physical examination as conducted by the author, presumably at the time of the consultation; next follow remarks as to diagnosis, prognosis, and treatment. And so for a series of nine cases representative of the following conditions: (1) Malnutrition from (*a*) an insufficient supply of food, (*b*) an insufficient amount of proteid food, (*c*) an insufficient amount of breast milk; (2) rickets with (*a*) atelectasis of lung, (*b*) secondary anæmia; (3) late rickets; (4) and (5) scurvy; and (6) infantile atrophy. As it happens none of these cases present any difficulties in diagnosis, and very few of them any points of interest in connexion with treatment or prognosis, and they cannot be said to represent satisfactorily or completely the various phases of malnutrition. In the preface to the second edition we are told that the diagnosis and prognosis is in each case correct. In our review of the first edition we pointed out that there was no evidence, either direct or indirect, to show that this was the case, and now on reading many of these cases for the second time we feel inclined to submit that on *primâ facie* evidence the symptoms "*might*" bear different interpretations from the ones assigned, although no doubt the diagnosis as given is correct.

In this edition we are glad to notice that many of the blemishes which detracted from the literary merits of the first issue have disappeared, and that the introduction of more distinct headings to many of the paragraphs has greatly improved the general appearance of the book and made it distinctly less monotonous reading. For the rest we may add that the number of cases included in the various sections is considerably increased, and that some 60 pages dealing with the normal development and physical examination of infants and children are added "in order that the reader may be the better able to study and analyse the cases." These introductory pages should be decidedly useful. To one objection in our review of the first edition—viz., that there was no indication as to the nature of any particular case further than that it belonged to such-and-such a group until the reader had reached the paragraph which dealt specifically with the diagnosis, the author replies that the diagnosis or nature of the case is not given at the head of each because by making this omission the reader may formulate a diagnosis for himself from the information afforded. From this point of view no doubt much is to be said in favour of the general arrangement.

Cystoscopy and Urethroscopy for General Practitioners.

By BRANSFORD LEWIS, B.S., M.D., F.A.C.S., Professor of Genito-urinary Surgery, Medical Department of St. Louis University, &c., and ERNEST G. MARK, A.B., M.D., F.A.C.S., Professor of Genito-urinary and Venereal Diseases in the University Medical College, Kansas City, &c. With a chapter by WILLIAM F. BRAASCH, M.D., Attending Physician to the Mayo Clinic, Rochester, Minnesota. With 113 illustrations, 23 in colours. Philadelphia: P. Blakiston's Son and Co. 1915. Pp. 238. Price $4·50 net.

THE importance and value of cystoscopic examination are increasing year by year, and many works are appearing in which instruction is given as to the methods to be employed and the appearances to be noted. We would not for a moment under-value this form of instruction, for it has its definite place in the teaching of cystoscopy, but it must be clear to everyone that the only satisfactory method of acquiring a really useful knowledge of the methods of examining the bladder is by study at a suitable clinic. Nevertheless there is much that can be learned from books about the methods to be employed and the appearances seen, and we do not know any work which is better suited than this to instruct the student. It starts from the beginning and does not presuppose any knowledge on the part of the reader; the descriptions are clear and accurate, and the book is adequately illustrated.

We can hardly agree with the authors that cystoscopy can be readily employed by those in general practice, and especially do we doubt whether such a delicate operation as ureteral catheterisation should be undertaken by anyone who has not opportunities for much work of the kind. Still, no doubt, cases do occur in which general practitioners have the opportunity to acquire dexterity in this department of surgery, and there is no real reason why they should not, but to anyone who is inclined to devote attention to cystoscopy we would recommend strongly the need for careful training in a hospital. With such a training this work would prove of the greatest value to the practitioner; it would supplement the instruction of his teachers, would clear up difficulties which he would encounter, and would render his knowledge more complete and thorough than it would have been without it.

The Determination of Sex.

By L. DONCASTER, Sc.D., Fellow of King's College, Cambridge. With 23 plates. Cambridge University Press. 1914. Pp. 172. Price 7*s.* 6*d.* net.

Dr. Doncaster discusses the problems of the determination of sex as they relate to animals and man in a readable and interesting book.

The subject of the book is thus divided: The Problem, the Nature, and Function of Sex; the Stage of Development at which Sex is Determined; Sex-limited Inheritance; the Material Bases of Sex Determination; the Sex Ratio; Secondary Sexual Characters; Hereditary Transmission of Secondary Sexual Characters; Hermaphroditism and Gynandromorphism; General Conclusions on the Causes which determine Sex; the Determination of the Sex in Man. At the end there are a useful glossary of technical terms and a complete bibliography of the matter consulted.

To the veterinarian and, we think, to the physician the chief interest attached to the work will be its wide range over the vagaries of the subject as demonstrated in the animal world. The whole mystery of the final result of the procreative act is probably wrapped up in the statement by the author that "Sex depends on a physiological condition which may be brought about by more than one cause," and there is consequently good omen in the fact that many workers are now approaching the subject from many standpoints.

If any really exact knowledge on the determination of sex is attainable, it will be found in the pages of this book. The question may advantageously receive further and perhaps deeper study after this war is over, when a preponderance of male births will surely become an economic necessity. Twenty-two beautiful plate illustrations have been reproduced from drawings and photographs made by Mr. E. Wilson. The printing and get up of the book are of high quality.

Sanitation in War.

By Major P. S. LELEAN, F.R.C.S.Eng., R.A.M.C., Assistant Professor of Hygiene, Royal Army Medical College. Illustrated. London: J. and A. Churchill. 1915. Pp. 267. Price 5*s.* net.

IN a short introduction Sir Alfred Keogh alludes to the great importance of sanitation, and to the improvement in the health of the army that has taken place during recent years in consequence of the increased attention paid to the subject. "The intelligent coöperation of the whole personnel of the field force" is the one essential condition for success; and the more extended and the more precise the knowledge of the medical officers on all matters appertaining to the subject, the greater will be their success in maintaining the fighting efficiency necessary for a speedy and successful conclusion of the war. Major Lelean's lectures are not a systematic series dealing with the whole scope of sanitation in the army, but treat with satisfactory thoroughness of the subjects of physical fitness, antityphoid inoculation, the march, inefficiency from sickness in peace-time and on active service, medical organisation in the field, and field conservancy and water-supply. There is also a chapter on the rôle of insects in war. All the essential points are given, and although the volume is very small in size, owing to the conciseness of the expression there is more detail in the practical directions than is found in many much more pretentious manuals. The author has treated his subject in an original way, and produced an extremely useful book, thoroughly up to date.

LIBRARY TABLE.

University College Hospital Medical School (University of London) Research Department. Director, Dr. CHARLES BOLTON. *Collected Papers.* Vol. IV., November, 1914.—Some of the papers in this collection were published in 1913, others in 1914. Perhaps it will suffice to show the wide scope of the subjects of research if we indicate some of the leading reprints. First, then, *Heart.* A Method of Measuring the Rate of Transmission of the Contraction Wave in the Dog's Auricle, by T. Lewis; Experimental Heart-block with Atrio-ventricular Rhythm, by J. Meakins; the Susceptible Region in A.-V. Conduction, by T. Lewis, P. D. White, and J. Meakins; the Effect of Vagal Stimulation upon Atrio-ventricular Rhythm, by T. Lewis; Observations upon Ventricular Hypertrophy, with Especial Reference to Preponderance of One or Other Chamber, by T. Lewis; the Excitatory Process in the Dog's Heart—the Auricles, by T. Lewis, J. Meakins, and P. D. White (from the *Philosophical Transactions*). Other papers are reprinted from the *Journal of Experimental Medicine* and the *Quarterly Journal of Medicine*, including a paper by C. Bolton on the Effects of Anæmia upon the Pathological Processes in Acute Ulcer of the Stomach, and another on the Experimental Formation of Acute Gastric Ulcers, by T. R. Elliott. Also by the same author, Pathological Changes in the Adrenal Glands, and the Sidney Ringer Memorial Lecture, published in the *British Medical Journal* in 1914. There are several contributions from THE LANCET on the Wassermann reaction, and one of physiological interest, the Nervous Mechanism of Micturition, by F. J. F. Barrington, from the *Quarterly Journal of Experimental Physiology* which was reported on by THE LANCET at the time of publication. Many other subjects are dealt with and go to swell this bulky and valuable record of original work.

Kent's Care for the Wounded. By PAUL CRESWICK, G. STANLEY POND, and P. H. ASHTON. London: Hodder and Stoughton. 1915. Pp. 212. Price 2*s.* net.—The authors of this book have presented a graphic and simple story of what Kent has done for the wounded. The story opens with the dramatic scene of the arrival at Bromley South Station of some wounded Belgian soldiers on Oct. 13th, 1914. A few conversational sentences vividly paint the picture. The order is "keep friends together as much as you can." These few words express the sympathetic foresight in the preparations made at a few hours' notice for the comfort and happiness of 2000 weary wounded soldiers. The scene at the station is again described in the chapter "One of Many Vigils." The reader's interest is here drawn to the waiting officials, stretcher-bearers, and nurses during the cold tedious night. Several typical hospitals are described, the surroundings of some being fortunately placed in the country and by the sea. Another chapter is devoted to the kitchen and its important work. Special pride is expressed in the possession of the many well-equipped theatres where several eminent surgeons have used their knowledge and skill for the benefit of the wounded. The successful nursing has been the result of the organisation of the British Red Cross Society, the St. John Ambulance, and the County Territorial Force Association. These three societies decided to join forces for the term of the war and are now known as the Kent Voluntary Aid Detachments. The chapter, "A Glance Backward," tells of the origin of the societies, their aims, their steady work and training for many years, the

benefit of which is now being reaped by those fighting for our country, and is emphasised by the fact that, in spite of early discouragement from the War Office as to the need or possible use of these hospitals, the call came suddenly by a telephone message after 10 o'clock at night: "Mobilise all your hospitals at once. Notify names of places, stations, and number of beds available at each to transport officers, Folkestone. Large number of wounded arrive to-night. Authority, Director-General A.M.S." Church halls, parish rooms, and other buildings were furnished and turned into bright hospital wards staffed with nurses, cooks, and orderlies. Within 14 hours of that call 2000 wounded Belgian and English were being fed and cared for in these hospitals. This work needs money and material help in gifts and loans, and the people of Kent have responded well. The sudden call found furniture, houses, funds, workers, waiting to be used for the establishment of hospitals all over the county. Stores were systematically collected and distributed, so that everything necessary was supplied. The book, apart from its own interest, is a public acknowledgment and encouragement to those responsible for the organisation of a great work, to those generous donors who have given their homes or their material help, and to that large band of workers who have given their leisure to training and to practical service. It should appeal to those, if any there be, who still hold back from giving help either in service or kind to their country. All the profits on the sale of the book are to be given to the Kent County War Fund. Similar good work is, of course, being done in other counties, but Kent is nearest the fighting front, and was early to take its big share.

Aids to Tropical Medicine. By GILBERT E. BROOKE. London: Baillière, Tindall, and Cox. Second edition. 1915. Pp. 230. Price 3*s.* 6*d.* net.—This is a very useful little volume and should be in the hands of all practitioners in hot countries. In 51 chapters it covers the whole ground, of course very briefly, but with due attention to all important points. There are some misprints—e.g., *hystolitica*, *Ceratopsyllidæ*—and some dubious statements. Excavations, such as the making of railway cuttings, are undoubtedly often followed by increase in mosquito prevalence (and malaria), but this is probably more likely to be due to collections of water in holes in the ground (forming breeding-places) than to rise in subsoil water, as stated by Mr. Brooke. The point is that the latter condition is beyond control, but the former can be easily prevented, or remedied, by adequate supervision. All tropical diseases are described in alphabetical order, and chapters on blood examination, disinfectants, fleas, flies, and rats are intercalated. Although the etiology and pathology of each disease are fully dealt with, the consideration of prevention is omitted, which seems to be a mistake.

Lessons in Elementary Hygiene and Sanitation, with Special Reference to the Tropics. By W. T. PROUT, C.M.G., M.B., C.M. Edin., Medical Adviser to the Colonial Office, &c. Fourth edition. London: J. and A. Churchill. 1915. Pp. 184. Price 2*s.* 6*d.* net.—We reviewed the third edition of this useful little students' manual at some length in THE LANCET of July 12th, 1913. It is unnecessary to add anything here, for in spite of its being called a new edition we have not been able in a page-to-page comparison to detect even the slightest change; it is a reproduction pure and simple, even to the mistakes—e.g., flagellæ as the plural of flagellum (pp. 78, 79, 84), bacillus malaria (p. 73), trachœa (p. 164). It is surely time also that "Dr. Manson" and "Dr. Ross" (pp. x. and 74) were accorded their proper dignities. These, however, are trifling defects in what we have previously described as an admirable handbook.

MISCELLANEOUS VOLUMES.

WE have received a number of text-books on analytical and physical chemistry, which we deal with briefly. None is exactly required by the student in his curriculum, but several will be found of distinct use to the practitioner. One of the most interesting features in the development of modern medicine, including hygiene and sanitation, is the increasing familiarity with chemistry demanded of the medical practitioner.

A good, clear, and concise account of the present position of physical chemistry is given in *The Elements of Physical Chemistry*, by J. LIVINGSTON R. MORGAN, Ph.D. (Fifth edition. London: Chapman and Hall, Limited. New York: John Wiley and Sons. Pp. 506. Price 12*s.* 6*d.* net). The attention given to this branch of chemistry, which has very interesting bearings upon physiological processes, has displayed recently important developments. To the practitioner who can spare little time for studying the various subjects in separate volumes devoted to special portions this book will be most convenient, for it presents, as the author states, the elements of the entire subject of physical chemistry in one volume. Thus a good preliminary insight into the nature of the phenomena of solutions, osmotic pressure, ions, the gaseous, liquid, and solid states, and so on, may be gained. Moreover, the author has avoided overburdening his book with mathematical considerations in their relation to the derivation of some of the laws involved.——*Molecular Association*, by W. E. S. TURNER, D.Sc. Lond., M.Sc. Birm. (London: Longmans, Green, and Co. 1915. Pp. 170. Price 5*s.* net), is one of the series of excellent monographs on inorganic and physical chemistry, edited by ALEXANDER FINDLAY, M.A., D.Sc., F.I.C. The subject is a difficult one, but the author prepares the way to its right understanding by a clearly written opening chapter. The behaviour of the molecule, the dependence of its degree of complexity on the nature of the constituent atoms, and on the forces which act on it from without receive an intelligible description. It is the varying molecular complexities of elements and compounds, and the existence of large molecules as associations of small ones, which are here carefully studied and explained in the light of modern developments. The book is a worthy addition to this series of monographs.

An excellent laboratory curriculum is provided for in *Directions for a Practical Course in Chemical Physiology*, by W. CRAMER, Ph.D., D.Sc. (Second edition. London: Longmans, Green, and Co. 1915. Pp. 102. Price 3*s.* net). The author adopts the admirable plan of introducing to the student such familiar things as the potato, egg, lard, and butter. This study necessarily brings him into contact with the nature of starches, proteins, and fats, hydrolysis and digestion. Milk, flour, and bread follow, and then he is led on to consider the proteins of muscle and of gland, the carbohydrates of the liver, the lipoids of nervous tissue, and the nature and composition of blood. Chapters follow on digestion and normal and pathological metabolism, in which certain new valuable practical points are introduced, notably in the case of the aceto-acetic acid test in urine. The instructions are lucid and are evidently the outcome of a close acquaintance with the actual performance of the tests and experiments described.——We are not surprised that *A Simple Method of Water Analysis*, by JOHN C. THRESH, M.D., D.Sc., D.P.H. (London: J. and A. Churchill. 1915. Pp. 69. Price 2*s.* 6*d.* net), has reached its eighth edition, since it sets out a simple plan for the examination of water-supplies of considerable service and convenience to medical officers of health and other sanitary officials. At any rate, by carefully following the instructions it is easy to differentiate between waters that are "good," "doubtful," and bad. In this edition a useful

chapter has been added on the purification of water by the chlorine method, first published in THE LANCET of Nov. 28th, 1908, p. 1597, in an article in which it was shown that an infinitesimal amount of chlorine present in water sufficed to destroy bacillus typhosus and bacillus coli.——*Mayer's Short Manual of Analytical Chemistry*, now edited by J. THOMAS, B.Sc. Lond. (London: Baillière, Tindall, and Cox. 1915. Pp. 237. Price 6*s.* net), has reached its tenth edition, which proves its utility in the hands of those, and particularly of pharmaceutical students, who require a laboratory guide to the qualitative and quantitative analyses of metals and their salts, as well as to the identification of alkaloids and the processes employed in the analysis of water, air, food, drugs, urine, and gases. The book is fully up to date, and the section on drugs has been brought into conformity with the B.P., 1914. The editor may be congratulated on the thoroughness with which he has carried out his useful task.——The requirements of students of medicine, dentistry, and pharmacy are carefully studied in *A Laboratory Manual of Qualitative Chemical Analysis*, by A. R. BLISS, jun., Ph.G., Ph.C., M.A., Phm.D. (London and Philadelphia: W. B. Saunders Company. Pp. 250. Price 8*s.* 6*d.* net). The tests given are very numerous, comprising all the well-known reliable ones for metals and for acids. The American spelling of some of the chemical compounds will be found troublesome by many English readers. A very clear general account of the chemistry of the carbon compounds appears in *Outlines of Organic Chemistry*, by F. J. MOORE, Ph.D. Second edition. (London: Chapman and Hall, Limited. New York: John Wiley and Sons. Pp. 325. Price 6*s.* 6*d.* net). The author has wisely elected to leave out complex questions of structure, and has preferred to give prominence to those organic substances of practical or technical importance, not omitting those familiar compounds which play a part in metabolism—e.g., glycogen and urea. The second edition is well up to date, as is evidenced in the account of the synthesis of rubber and the chemistry of new cyanogen compounds.

JOURNALS AND MAGAZINES.

Quarterly Journal of Experimental Physiology. Editors: E. A. SCHÄFER, W. D. HALLIBURTON, C. S. SHERRINGTON, E. H. STARLING, and A. D. WALLER. Vol. IX., No. 1. London: Charles Griffin and Co., Limited. 1915. Pp. 1–99. Price 7*s.* 6*d.*—A Small String-Galvanometer Arranged as a Signal Apparatus, by A. Samojloff. By means of this instrument, which is fully described and illustrated, the latent period of a muscle can be accurately determined. This method has great advantages as compared with observing the commencement of the muscle curve.—On the Electrocardiogram, by W. A. Jolly. Even with all the large additions which have been made in recent years to our knowledge of the electrical changes accompanying the heart beat, much remains doubtful, and the interpretation of the electrocardiogram is not yet complete. The two problems which await final solution are (1) the form of the electrical disturbance of active heart tissue; and (2) the course which excitation takes in passing over the heart. This paper deals with the form of the electrical change which passes over the cardiac muscle when it enters upon activity. The animals employed were the frog and tortoise—the heart either *in situ* with the pericardium open or isolated. Einthoven's string-galvanometer was used and the movement of the string was recorded photographically upon sensitised paper with a magnification of 660. It is assumed that warm-blooded and cold-blooded hearts yield essentially the same form of electrocardiogram. The author, after considering his own work in the light of previous researches, comes to the conclusion that since anabolism and katabolism must undoubtedly occur in active tissue, the suggestion that they have opposite electrical expression and underlie the component parts of the curve cannot be altogether ruled out of court. The paper is well illustrated. — Observations upon Vaso-motor Reflexes, by Swale Vincent and A. T. Cameron. The authors describe the effects of different kinds of anæsthetics and other drugs upon the vaso-motor reflexes—e.g., ether (where dog, cat, and rabbit have been employed as subjects), chloroform, chloral hydrate, urethane, morphia, and curare. They note the differences between the effects of stimulating various nerves, motor and sensory, and supply theoretical explanations of their results. They give also the effects of the strength of stimulus and the effects on blood pressure. Amongst other subjects permanent vaso-motor effects and their bearing upon "surgical shock" are discussed. We have only space available to record a few of their results. In an animal deeply under the influence of ether it is frequently impossible to obtain any vaso-motor reflexes whatever. At a certain stage of anæsthesia the effect of stimulating the central end of the cut sciatic nerve is a distinct rise; as the effect of the anæsthetic passes off the rise is followed by a more or less pronounced fall. Respiratory movements are now markedly increased, and the extent of the fall of blood pressure appears to be largely proportional to the violence of the respiratory activity. There seem to be two opposing influences, a reflex vaso-constriction producing a rise and violent respiration producing a fall. A similar fall of pressure is brought about by performing rapid artificial respiration by compression on the thorax, and can be induced in the human subject by rapid and deep voluntary respiration. The same results as those under ether generally obtain if chloroform, chloral hydrate, or urethane is employed. Under morphia similar stimulation may produce a rise of pressure, while mechanical stimulation of the skin produces a fall. Under curare stimulation in the great majority of cases causes a rise of blood pressure, an effect which seems largely to be due to cessation of the respiratory movements. The more widely the thorax is opened the more the fall of blood pressure obtained by stimulation of a nerve tends to become replaced by a fall. Weak stimulation usually causes a fall, while strong stimuli cause pressor effects. Cooling the nerve tends to produce vaso-dilator effects. In dogs stimulation of a recently regenerated sciatic nerve produces a fall, while stimulation of the normal sciatic produces a rise. Stimulation of the skin, kneading of muscle, and manipulation of the intestines all cause a fall of blood pressure under certain conditions and a rise under other conditions. The vaso-motor reflex from the intestine is abolished by full doses of nicotine, is reduced by section of the great splanchnic on both sides, and is abolished by extirpation of the semilunar ganglion. Some of these results are confirmatory of those of other observers. Whether a rise or a fall of blood pressure will result from stimulation of an afferent nerve (terminals or central cut end) depends on the relative effects of three primal factors: (*a*) reflex vaso-dilation; (*b*) reflex vaso-constriction; and (*c*) frequency and depth of respiration. The predominance of one or more of these factors is determined by (1) strength of stimulus; (2) number of fibres stimulated; (3) temperature of nerve; (4) nature of anæsthetic; (5) degree of anæsthesia; and (6) idiosyncrasy of the animal. — Studies in the Physiology of the Nervous System. On the Phenomenon of Facilitation. Its occurrence in reactions induced by stimulation of the "motor" cortex of the cerebrum in monkeys, by T. Graham Brown. This is the twenty-second contribution by the same author published in this journal, and is a continuation of his elaborate studies on the central nervous system. The subjects dealt with are the effect of applying a second stimulus after a first, the effect of repetition of stimuli in regular series, the effect of disturbing the regularity of series of stimuli in otherwise regular series, and the effect upon the phenomenon of facilitation of a previous freezing of the cortical point stimulated.

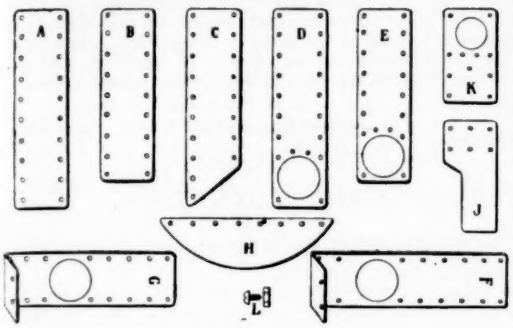
New Inventions.

A NEW UNIVERSAL PORTABLE SPLINT.

THIS portable splint is of an entirely new pattern and combines the following advantages:—1. Universal adaptability to any limb or part of a limb. Any splint can be formed, from the long Liston, Sharp's, Cline's, or Carr's, to the pistol, internal angular, or finger splint. 2. Extreme portability. The whole outfit, including case, weighs 1¼lb. and measures 9 × 2½ × 2 inches. 3. Simplicity of construction. The sections are fitted together with bolts and nuts into any required shape by the use of the fingers only, no tools being required. 4. It is aseptic, being made of plain metal. 5. It is quite rigid. 6. It is permeable to the X rays, permitting radiography without removal of the splint. 7. The various sections are replaceable separately if desired without buying an entire new outfit. Economy of space, time, and money are thus secured.

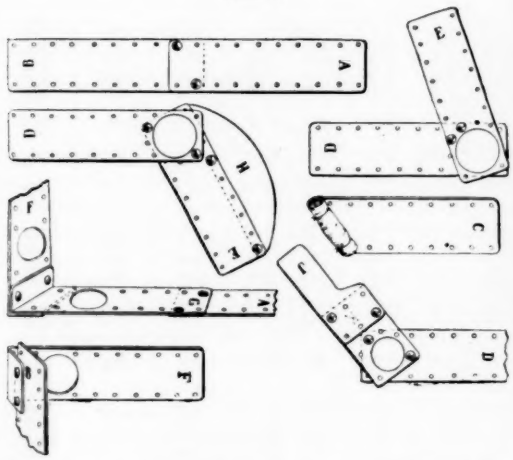
The splint consists of eleven pieces of flat metal (see Fig. 1) which can be bolted together by means of series of holes bored at corresponding intervals, so that any section may be bolted to any of its fellows to form any length and

FIG. 1.



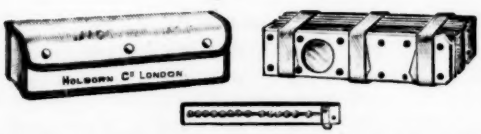
any angle. (Fig. 2.) Thus straight splints may be made from 8 in. to 4 ft. 8 in. in length, internal or external angular splints with fenestra for the condyle at any angle, obtuse, acute, or right; Carr's or pistol splints for wrist or

FIG. 2.



metacarpus, and finger or thumb splints. By means of two sections bent on the flat, anterior and posterior angular splints, or leg splints with sole, plate, or foot-piece, may be constructed with fenestra for the malleolus. The bolts and nuts are carried in a flat holder, from which they are unable to fall out. They occupy a minimum of space, and two sections can be firmly bolted together with the fingers only in 30 seconds or less.

FIG. 3.



The whole apparatus, in bright aseptic metal, with bolts, padding, and triangular bandage, kept together by the buckles and bands used in their application, is contained in a neat khaki case which can be carried in the pocket. (Fig. 3.)

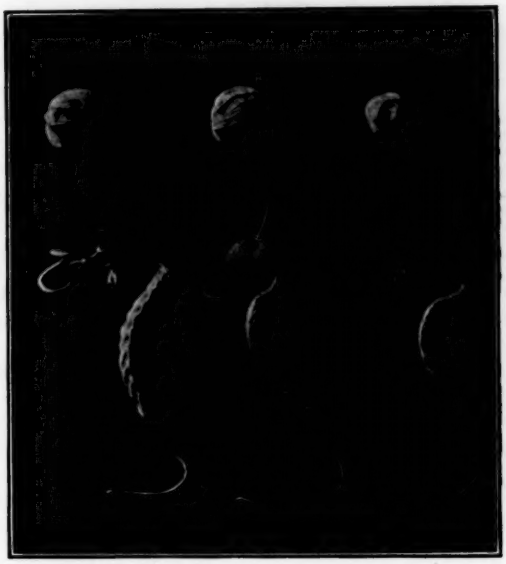
The splint has been constructed to my design by the Holborn Surgical Instrument Co., Limited, 26, Thavies Inn, Holborn Circus, London, E.C.

F. THOMPSON, M.R.C.S., L.R.C.P. Lond.
Sunbury-on-Thames.

A NOTE ON WICK DRAINS.

THE ordinary drain or "plugging" of folded gauze takes a certain period of time to make. When the gauze is at all hard or its fibre coarse, partially glazed or mercerised, as is notably the case with some of the American gauzes, the difficulty of folding is increased. Machine-made plugging is expensive and the sizes to hand are not always those required. It occurred to me that at this time, when large quantities of plugging are required for use with hypertonic or other treatment or for stopping a secondary hæmorrhage, it would be advisable to use some form of cheap lamp wick, but the woven varieties are rather closely knit and the twisted varieties are apt to be unmanageable with a probe. Some of the wicks sold do not absorb water.

A simple solution of the problem, apart from constructing a machine for the purpose or adapting a knitting machine, is to utilise a child's knitting reel with which reins or "cats' tails" are made. Three pins to the reel seem to be better than a larger number, but if a more truly circular and tubular wick is desired a larger number may be used. In this case the product is either closer in texture or unduly large.



The illustration shows three reels of convenient sizes, the drains being 1/2 inch, 3/8 inch, and 1/4 inch in diameter respectively. These sizes are made by employing reels of the following measurements (in inches):—

Diameter of wick	1/2	3/8	1/4
Size of reel—			
Height	1	1 1/4	1 1/2
Outside diameter ...	2	1 1/2	1 1/2
Diameter of hole ...	1 1/4	1/2	3/8
Side of triangle	1 1/2	5/8	5/8
Size of cotton	2	4	10

In the above table the only important measure is the distance between the feet of the (equilateral) triangle formed by the pins, because on this depends the size of the stitch in the tail. The other measurements merely indicate the sizes of reels convenient to work with. Any reel large enough to take the triangle and having a hole large enough not to compress the tail will do. Any kind of pin or tack will answer the purpose, but a convenient thing to use is a full-gauge, 5/8 inch, brass escutcheon pin, sold by most ironmongers.

The cotton used is Alexander's 4-thread knitting cotton (bleached), and the sizes to correspond with reels of the above-mentioned measurements are No. 2 (thick), No. 4 (medium), and No. 10 (thin), the approximate diameters of these threads being 1/8 inch, 1/16 inch, and 1/32 inch (the last one plus). This cotton is a smooth loose twist of four strands which

does not tend to fray out and is lissome and absorbent. Any soft-fibred cotton will do, but for each size there is a corresponding size for the sides of the triangle if a tail of the right body and tension is to be obtained—viz., one in which the mesh is open and the strands do not fall and cling together. The cost at retail price of the cotton mentioned is 1*s.* 2*d.* the ½ lb. hank for all sizes. Each hank makes: Of No 10 (thin) 130 yards of wick—time 36 hours; of No. 4 (medium), 42 yards of wick—time 9 hours; of No. 2 (thick), 22 yards of wick—time 5 hours. The thick size is cut into lengths of 6 and 10 inches, the medium into lengths of 4 and 7 inches, and the small into lengths of 3 and 6 inches, the loose clippings removed, and the ends caught up into a single knot; or this may be done in the making. This process adds about four hours to the total time for the above-mentioned quantities. The thick variety is more suitable for use as plugging than as a drain, and for drainage should be used two or more strands of the medium instead of one of the thick size.

Convalescent patients or children can readily make large quantities of these drains and thereby save a good deal of the nurse's time which at present is taken up in folding gauze. There are no raw edges; the mesh is open and the absorbing power great, partly owing to the choice of material and partly to the sizes of the stitches. The twist in the cotton produces a high degree of capillarity and the attraction between the films in the meshes is considerable.

G. H. COLT, F.R.C.S. Eng.,
Assistant Surgeon, Royal Infirmary, Aberdeen.
Aberdeen.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

COMMITTEE FOR THE INVESTIGATION OF ATMOSPHERIC POLLUTION:

Summary of Reports for Month ending April 30th, 1915.

1	2	3	4	5	6	7	8	9	10	11	12
			Metric tons of deposit per square kilometre during month.								
			Insoluble matter.			Soluble matter.			Included in soluble matter.		
Place.	Correspondent.	Rainfall in millimetres.	Tar.	Carbonaceous other than tar.	Ash.	Loss on ignition.	Ash.	Total solids.	Sulphates as (SO_4).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND—											
Birmingham, Centra[1]* ...	Dr. J. Robertson, M.O.H.	—	—	—	—	—	—	—	—	—	—
,, Aston	,,	27	0·16	1·93	5·61	1·0	2·9	11·6	1·7	0·2	0·03
,, S.W.	,,	31	0·04	1·40	3·06	0·5	2·2	7·2	1·2	0·2	0·06
Bolton	Dr. J. E. Gould, M.O.H.	54	0·04	1·05	2·37	2·16	5·82	11·44	3·18	0·97	0·04
Exeter	Mr. F. Southerden.	19	0·03	1·68	4·14	0·84	1·87	8·56	1·16	0·17	0·02
Kingston-upon-Hull	Mr. A. R. Tankard, Public Analyst.	12	0·08	2·22	4·13	1·32	2·12	9·87	1·21	0·23	0·02
Liverpool	Dr. E. W. Hope, M.O.H.	38	0·13	4·76	10·20	2·84	4·07	22·00	2·59	0·65	0·13
London—											
Meteorological Office ...	Director, THE LANCET Laboratory.	34	0·13	0·01	4·12	2·93	4·00	11·00	1·69	0·85	0·06
Embankment Gardens...	Mr. J. Ollis, Chief Officer, Public Control Department, L.C.C.	30	0·29	3·04	7·96	1·97	4·97	18·23	2·79	0·93	0·12
Finsbury Park	,,	20	0·07	0·49	2·99	0·42	2·29	6·26	1·26	0·22	0·02
Ravenscourt Park	,,	30	0·10	1·86	6·96	1·40	4·37	14·68	2·51	0·38	0·18
Southwark Park	,,	31	0·11	3·22	7·44	4·60	0·99	16·36	2·62	0·53	0·09
Wandsworth Common ...	,,	21	0·04	0·91	3·01	1·33	3·93	9·24	2·44	0·43	0·04
Victoria Park	,,	24	0·04	1·42	7·83	0·91	3·11	13·31	1·92	0·30	0·05
Golden Lane	Dr. W. J. Howarth, M.O.H.	22	0·07	3·29	4·76	1·87	3·75	13·76	2·58	0·55	0·12
Malvern	Mr. W. Osborne Thorpe, Engineer U.D.C.	17	0·01	0·12	0·14	0·27	0·53	1·07	0·25	0·11	0·12
Manchester—											
Aucoats Hospital	Mr. J. Warrington, Secretary, Air Pollution Advisory Board.	38	0·07	4·02	11·47	2·26	8·12	25·94	4·54	0·98	0·08
Bowdon	,,	31	0·01	0·58	2·93	0·64	2·56	6·72	1·37	0·36	0·04
Cheadle	,,	36	0·06	1·99	5·64	0·80	2·77	11·26	1·64	0·45	0·05
Davyhulme	,,	31	0·01	1·01	4·13	1·15	4·94	11·24	2·50	0·70	0·08
Fallowfield	,,	37	0·03	1·53	5·11	1·12	4·54	12·33	2·49	0·60	0·04
Moss-side	,,	38	0·10	2·08	6·01	1·71	4·81	14·71	2·56	1·01	0·06
Philips Park	,,	24	0·04	4·62	10·63	2·15	7·48	24·52	3·92	0·99	0·03
Queen's Park	,,	34	0·06	1·80	5·43	1·83	5·72	14·64	3·14	0·86	0·03
School of Technology ...	,,	36	0·21	3·19	8·92	1·39	4·48	18·19	2·32	0·96	0·05
Whitefield	,,	35	0·04	1·47	5·51	1·01	5·41	13·44	3·11	0·63	0·05
Newcastle-on-Tyne	Dr. H. Kerr, M.O.H.	13	0·27	4·35	11·76	1·19	3·27	20·85	2·48	0·25	0·07
Oldham	Dr. J. B. Wilkinson, M.O.H	45	0·262	4·70	17·0	2·89	6·47	31·3	3·66	0·85	0·11
Sheffield—											
Attercliffe Burial Ground	Professor W. P. Wynne, The University.	22	0·14	3·01	6·78	1·99	3·32	15·24	1·49	1·41	0·04
Hillsborough Park	,,	30	0·08	1·03	4·69	0·90	3·66	10·36	1·78	0·58	0·02
Meersbrook Park	,,	27	0·07	1·21	4·21	0·54	3·80	9·83	1·87	0·58	0·02
Weston Park	,,	29	0·05	1·03	3·63	1·10	2·97	8·78	1·72	0·55	0·02
York...	Dr. E. M. Smith, M.O.H.	27	0·06	0·97	2·8	1·05	2·15	7·03	0·98	0·43	0·07
SCOTLAND—											
Coatbridge	Mr. A. G. Dutch, Chief Sanitary Inspector.	56	0·12	1·88	4·50	1·19	2·26	9·93	1·54	0·47	0·13
Greenock	Mr. J. Devine, Sanitary Inspector.	83	0·08	1·31	3·51	2·10	3·64	10·64	1·71	1·13	0·16
Leith	Mr. Thomas Bishop, Sanitary Inspector.	23	0·05	1·84	4·26	1·38	1·84	9·37	1·26	0·23	0·09

* Gauge tampered with, results unreliable.

Col. 4 includes all matter insoluble in water but soluble in CS_2. Col. 5 includes all combustible matter insoluble in water and in CS_2. Col. 6 includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9 lb. per acre; (*b*) 2·56 English tons per sq. mile; (*c*) one gramme per sq. metre; (*d*) 1/1000 millimetre of rainfall (see Col. 3).

The analytical work involved in these returns was undertaken respectively by J. F. Liverseege, F.I.C., Birmingham; Harry Hurst, B.Sc., F.I.C., Bolton; F. Southerden, B.Sc., F.I.C., Exeter; A. R. Tankard, F.I.C., Kingston-upon-Hull; W. H. Roberts, M.Sc., F.I.C., Liverpool; S. A. Vasey, F.I.C., Director, THE LANCET Laboratory (London Meteorological Office collections); J. H. Coste, F.I.C. (Embankment Gardens, Finsbury Park, Ravenscourt Park, Southwark Park, Wandsworth Common, Victoria Park collections), London; F. L. Teed, D.Sc., Golden-lane, London, E.C.; C. C. Duncan, F.I.C., Malvern; E. Knecht, Ph.D., M.Sc., Aucoats Hospital, Bowdon, Cheadle, Davyhulme, Fallowfield, Moss-side, Philips Park, Queen's Park, School of Technology, Whitefield (Manchester collections); J. T. Dunn, D.Sc., Newcastle-on-Tyne; Samuel Urmson, Oldham; Professor W. P. Wynne, Attercliffe Burial Ground, Hillsborough Park, Meersbrook Park, Weston Park (Sheffield collections); S. H. Davies, M.Sc., York; Messrs. R. R. Tatlock and Thomson, Coatbridge; Messrs. J. W. Biggart, F.I.C., and McCowan, Greenock; A. Scott Dodd, B.Sc., F.I.C., and R. M. Clark, B.Sc., Leith and Paisley respectively. The correspondents referred to in col. 2 are for the most part public health authorities.

THE LANCET.

LONDON: SATURDAY, AUGUST 21, 1915.

The Treatment of Wounds in War.

WE published in THE LANCET of July 31st an article entitled "Observations on the Treatment of Wounds in War," by Sir W. WATSON CHEYNE, and in the same issue a leading article on the subject. We have now seen at the War Office certain communications which for very good and comprehensible reasons it has not been thought expedient to publish, but to whose meaning and teaching reference ought to be made immediately in these columns, having regard to inferences that might be drawn from the leading article already referred to. It has been represented to us that we suggested that the method devised by Sir WATSON CHEYNE for the treatment of wounds by borsal powder and cresol paste was superior to other methods, and that the investigation of its claims had been improperly and carelessly carried out. There is a sentence in the leading article upon which this construction could be put, but it was not intended to convey such a message to our readers. We state now the position as supported by the documents which we have seen at the War Office.

As is well known, Sir WATSON CHEYNE early in the year devised a method of treatment for wounds after careful experimentation; and arrangements, we understand, were made in the spring to set aside 50 beds at one of the large base hospitals in France so that the effects of borsal powder and cresol paste could be tried, in appropriate circumstances and carefully, in accordance with Sir WATSON CHEYNE'S printed instructions. But almost immediately upon the decision to do this came the big fighting in front of the British lines which lasted from the middle of April to the middle of May, and accordingly the trial of the method was deferred. The consultant surgeons and the authorities with the Expeditionary Force considered that a definite idea of the value of any general method for the treatment of wounds should be obtained before its indiscriminate use was sanctioned. Later, however, a certain number of cases were treated by a surgeon enjoying Sir WATSON CHEYNE'S confidence, who wrote a memorandum in favour of the method, although he appears not to have followed Sir WATSON CHEYNE'S technique with great strictness. Other surgeons reported differently, being not so fortunate in their results. Officers of different rank attached to different hospitals tried the method, we presume being guided by the printed directions, and their collective opinion was unfavourable to the employment of borsal and cresol. Their criticism was twofold and had the following general significance, though some observers laid stress on one point and some on others. In slight wounds other applications, they thought, would be as useful as those under trial, while in deep wounds the blocking of the external exits by the paste and the consequent damming of the secretions produced sinister conditions. The favourable memorandum did not prevail against this cumulative adverse opinion, and was itself submitted to severe criticism. Two distinguished consulting surgeons, appraising the worth of the memorandum, commented on the absence of severe cases from its author's clinical record. Compound fractures and crushed fractures, for example, were noted as not having been treated by the author, while it would seem that he had given to his cases an amount of individual and continuous care which it would be quite impossible in the ordinary course of events for the medical officers to provide. The evidence for borsal powder and cresol paste was thus weakened, and the method of treatment was suspended.

It is quite certain that Sir WATSON CHEYNE was not aware of the general nature of the trials that had been made of the treatment which he recommended, while in the teeth of the experiences detailed by medical officers with the Expeditionary Force it was inevitable that the treatment should be abandoned, at any rate until the reasons for the numerous failures had been appreciated and removed. But no apprehension should arise that this may have meant some desertion of antiseptic surgery at the front. Throughout the campaign antiseptics have invariably been used in the initial treatment of wounds behind the firing line, at the field ambulances, dressing stations, and similar formations, as is well shown in the admirable Memorandum on the Treatment of Injuries in War, which has just been issued to medical officers and which we review elsewhere. Conditions must often be present in the firing line when septic contamination of wounds is quite unavoidable, and if cresol and borsal had proved able to prevent serious infection during the interval before the wounds could be thoroughly disinfected the method of treatment would, of course, have been adopted. That the method has failed to commend itself to those responsible for the treatment of our wounded in France and Belgium must not be taken to mean that there has been any relaxation of the standards of surgical technique with the army.

The Food-Supply of the German People.

WE published in THE LANCET of Feb. 20th a full abstract of an authoritative statement edited by Dr. PAUL ELTZBACHER, acting rector of the Berlin High School, on the food-supply of the German people. There has now been issued from the University of London Press the text of the conclusions of this study as drawn up by 16 German

experts of admitted scientific and economic reputation.[1] Dr. A. D. WALLER, in his admirable critical introduction to this book, puts the case shortly thus:—"The total calorimetric values per annum as stated by the Berlin committee are as follows: (1) With a population of 66·67 million heads (men, women, and children), you used for 1913 88·65 billion calories—i.e., you would have used, with a population of 68 millions for 1914, 90·42 billion calories. (2) Your minimum physiological requirement is 56·75 billion calories. (3) You should produce at home normally 71·24 billion calories, or allowing for abnormal conditions a fall in production of 5 per cent., say, 67·68 billion calories. (4) You can, by extraordinary measures of economy, raise your home production to 81·25 billion calories. These figures, 90·42, 56·75, 67·68, and 81·25 billions, reduced to values per head per day, come out as follows: (1) You used for 1913–14 4779 cals. per man per day. (2) You require for 1915–16 3000 cals. per man per day. (3) You will have at home for 1915–16 3577 cals. per man per day. (4) You *can* have at home for 1915–16 4295 cals. per man per day. Therefore you will pull through in spite of the British attempt to outhunger you." In our abstract of this report we stated that it was clear that in many directions considerable apprehensiveness existed, especially in regard to preserving under the conditions imposed upon the country by the war a physiological balance of foodstuffs; and we added that there could be little doubt that Germany possessed a great reserve of sugar-supply, and could no doubt go on producing it. But there was anxiety concerning the foodstuffs supplying the nitrogenous tissue reparatives, in the form chiefly of meat, milk, and fish. Dr. WALLER remarks that signs are not wanting that even the imperfect limitation of food-supply brought about by the state of war is producing upon the health and strength of Germany some portion of the effect that was to be anticipated. The upshot of the report appears to be that the attempted and so-called hunger war of Great Britain against Germany can be defeated by adopting measures of economy, and Germany in that case cannot be starved. Dr. WALLER regards this as a hypothetical conclusion. The full facts of the case are now available to the English public. Dr. WELLS'S English version of this characteristically painstaking investigation is admirably done, and he has rendered a good service by interpreting so ably this very remarkable economic and physiological computation.

[1] Germany's Food. Can it last? A Study by German Experts. Edited by Professor Paul Eltzbacher. English version edited by S. Russell Wells, M.D., B.Sc., with a critical introduction by A. D. Waller, M.D., LL.D., F.R.S. London: University of London Press. 1915. Pp. 232. Price 2s. net.

INAUGURAL ADDRESSES AT THE OPENING OF THE WINTER MEDICAL SESSION.—The winter session at Middlesex Hospital Medical School will begin on Friday, Oct. 1st, when Dr. John Cameron will deliver the opening address. At the School of Medicine of the University of Leeds, which opens on the same date Sir William Osler, F.R.S., will address the students.

Annotations.

"Ne quid nimis."

AN ANATOMIST ON ETHNOLOGY.

IT is, of course, one of the oldest observations in ethnology that extraordinary similarities exist between the customs of races widely separated from each other both by time and by geographical boundaries. Travellers have recorded wonderful survivals of the very oddest and most unnecessary details in these customs, and ethnologists have become accustomed to accept the great likeness in the works of early man in different parts of the world as a mere matter of course. As an instance we may take the identity shown in the details of some of the early American civilisations with similar details observed in past or present customs amongst peoples remotely separated from the American continent. How is it that things so wonderfully alike, things often trivial and unnecessary, crop up in outlying parts of the world among utterly different races of mankind? Suppose, before attempting the answer to that question, we state another and an entirely different one. How is it that so wonderful a similarity exists between the details of structure of, say, a monkey and a man? To this last question we give an answer to-day very different from that given before the general acceptance of the principle of evolution. But to the first question the answer current 60 years ago, when knowledge of the human story was limited to biblical teaching, is the answer which still holds good to-day. We have only to turn to such pre-Darwinian writings upon the similarity of American and European antiquities as those of Daniel Wilson and the slightly later ones of Dawson to realise how entirely hedged in by biblical chronology the ideas of the ethnologist were. In such writings as these the similarity in human works to the instinctive exploits of the bee and the beaver took root so deep that the belief in its significance flourishes fresh and green to-day. It would probably astonish a modern ethnologist to be told that his ideas upon his own subject are enveloped in the same hazy atmosphere as that which surrounded the views of the zoologists before the advent of Darwin's greatest work. He would be surprised to learn that the legacy of Genesis still trammelled all his thoughts, and the surprise would probably not be lessened if this information were to come from one not in the ranks of the ethnologists. But it would certainly seem that Professor Elliot Smith is telling these things to the professed students of ethnology, and telling them, too, in no unmistakable manner.[1] In some ways the origin of any piece of work, especially if the subject be somewhat outside the regular beat of the student's inquiries, is an important factor in determining the value to be attached to the work. The origin of this departure into ethnology by an anatomist is, to our mind, one of its strongest recommendations. It was in the tracking of definite physical anthropological features around the world that the trail of the curious customs embraced in the so-called "heliolithic" culture became so

[1] On the Significance of the Geographical Distribution of the Practice of Mummification: A Study of the Migrations of Peoples and the Spread of Certain Customs and Beliefs. By Professor G. Elliot Smith, M.A., M.D., F.R.S. From vol. lix, Part 2, of Memoirs and Proceedings of the Manchester Literary and Philosophical Society. 1915. Manchester: 36, George-street. Price 2s. 6d.

obvious that it could not be ignored. It is with the many odd items in the make-up of this culture that Professor Elliot Smith is concerned. Having already followed the evolution of tomb-building which culminated in the Pyramids of Egypt, and having traced the influence of this cult in the megalithic monuments of other parts of the world, a host of other customs prevalent in ancient Egypt were found to occur in varying associations along the track of the megalith. One of the most conspicuous of these associated customs is the attempt at preserving the dead body by some process of embalming or mummification; and in tracing mummification into the remotest corners of the earth Professor Elliot Smith appears to us to have established his case beyond any dispute. Here we are glad to see is the death-blow to all those speculations associated with what we may term the "bee and beaver" period. There is not in this, often repulsive, business of trying to preserve the dead any inherent human instinct; it is a definite cult, and has been carried from place to place by advance agents of the heliolithic ritual, its most minute, and often unnecessary, details being persisted in in the face of the greatest natural difficulties. Mummy-making in the dry climate of Egypt is a comparatively easy and not necessarily a very unpleasant business; and, moreover, its natural origin in Egypt is easy to explain. But the preservation of the body in a damp tropical land is a very different affair; it is not to be assumed that any human instinct dictated the attempt in climes where decomposition is so disgustingly rapid; it is only to be wondered at that, having received this ritual as part of a taught cult, the natives of these places have persisted so long in their attempts at a very beastly, and never very successful, business. We cannot deal with the host of points of corroborative evidence, and, indeed, it is evident that Professor Elliot Smith himself has been unable to bring into play a tithe of the available details which all point so certainly in the same direction. It is enough to say that for anyone who is not a professed ethnologist the conclusion is quite unavoidable—these things have been spread by early human missionaries. The speculations which naturally arise are beyond enumeration, but must suggest themselves to everyone, and must one day be answered. How far back must we now place the dawn of the architect? Is any of the work of man—the chipping of flint, the primitive art of the potter, which manifests itself in such similar forms—the outcome of the "bee and beaver" instinct? Professor Elliot Smith has opened up an immense field, and he has shown once again that a vast mass of details may be collected and built up, and yet the very masons engaged on the task may not see the form of the edifice they are raising so clearly as one who happens to pass by at some little distance from the site of their labour.

"GHOSTS" ON THE CINEMA.

SYPHILIS has been described more than once in lay literature, and with what may be considered a very fair approximation to truth, though there is no subject over which more blunders have been made by distinguished authors. Brieux has dealt with the subject in *Les Avariés*, and, in more romantic vein, Ibsen has given us what he doubtless believed to be a typical account of the matter in his great drama *Ghosts*. A private representation of this play was given in their studio recently by the Dominion Exclusives Company, a cinematograph company especially concerned with productions of artistic interest. The setting, copied from the Norwegian originals, and the acting of the principal performers were excellent. The satyr-like chamberlain Alvius and his luckless son Oswald were performed by Mr. Henry Walthall, who gave a truly tragic representation of the onset of general paralysis. It is an affair of terror and pity quite in accordance with the Aristotelian canon. But pathology, or rather medicine, boggles at Ibsen's doctrine and his art. Is it a fact, we may be permitted to ask, that an *Inherited Burden*, for so the cinema play is called, is handed on in quite this tremendous manner? Paracelsus held Ibsen's view, and the Scriptures support it in many famous texts. It is a question, however, whether the transmission of lues, leprosy, and so forth is so inevitable and terrible. In a recently discussed report from the bacteriological laboratory of the London Hospital[1] evidence is adduced which goes to show that out of 1000 children of the artisan class only 2 were hereditary syphilitics, and of these one died early and the other showed symptoms making it unlikely that he could live to the age of the unlucky Oswald in *Ghosts*. Oswald's case in *Ghosts* would seem to fall under the heading "Quaternary Syphilis," mentioned in the last edition of Mr. C. F. Marshall's well-known treatise on syphilis and venereal disease. It is a question whether there are many such belated cases. At least they are not typical, as Ibsen would have us suppose. They are terrible exceptions, and as such they certainly point a moral.

MULTIPLE ABSCESS OF THE BRAIN: RECOVERY AFTER OPERATION.

Dr. John Guttmann reports the following interesting case in the *Laryngoscope* for May. The patient was a woman aged 33, who, after perforation of the drum of the ear, developed, some weeks later, an acute mastoiditis. She complained of very severe headache, nausea, sleeplessness, depression, and fever. The mastoid operation was performed. In the antrum there was only a small amount of pus, but a good deal of granulation tissue. For two days the general state improved, but on the third the temperature suddenly rose to 102° F., with much headache on the left side. There developed a slight drooping of the left upper eyelid, a slight ptosis, and slowness of cerebration. Nausea and general malaise were present. The eye-grounds were normal, as was also sensation to touch and pain. The labyrinth reaction was normal, although the caloric test on the left ear showed a somewhat sluggish reaction. The pulse-rate was only 66, and an amnesic aphasia developed. A second operation was performed, and the temporo-sphenoidal lobe was exposed after removal of the squama of the temporal bone. The brain was explored in different directions. When the director was inserted anteriorly and downwards an ounce of thin non-fœtid pus was evacuated. No lining membrane existed for this cavity. It was packed with iodoform gauze and the patient returned to bed. Some improvement followed, but the amnesic aphasia continued. Five days later the patient became worse and the aphasia was more marked. Again the brain was explored, and this time the director, when directed upwards

[1] Dr. P. Fildes: THE LANCET, July 10th, 1915, p. 82.

towards the cortex, evacuated half an ounce of pus. The next day from the wound appeared clear cerebro-spinal fluid, due to fistula from the lateral ventricle; this, however, soon closed and the patient made a full recovery.

THE PREVENTION OF SCARLET FEVER AND MEASLES.

IT is unfortunate that in the case of the commonest infectious diseases, such as scarlet fever and measles, we are still in ignorance of the microbic agents at work. We are thus unable in either case to identify the modes of diffusion of the virus responsible for the disease and to combat it directly on scientific lines; we can only judge by experiments based on general principles of isolation and antisepsis. We had occasion previously to notice the claims advanced by Dr. Robert Milne, medical officer to Dr. Barnardo's Homes, as to the results obtained in these institutions in limiting the spread of outbreaks of scarlet fever by the use of measures directed to disinfection of the throat and skin, and similar claims as to control of outbreaks of measles are now advanced by the same physician.[1] The essence of the method advocated is the early employment of glycerine and carbolic acid for swabbing the children's throats, and thorough inunction of pure oil of eucalyptus over the whole surface of the body. In the case of measles, owing to the coryza and bronchitis which characterise the first stage of the disease, it is advisable in the earliest period to employ in addition a light screen of gauze stretched on a cradle, covering the patient's head and shoulders, so as to obviate the danger of particles of infected mucus being disseminated in the act of coughing. Dr. Milne finds that if these measures are effectively carried out it is possible for children who are the subjects of measles or scarlet fever to be kept in the same room with their healthy companions throughout their illnesses without any conveyance of infection. It certainly needs some courage to mix the sick and the healthy in the manner thus recommended, but the success which has attended the method at Dr. Barnardo's Homes certainly justifies further investigation of the degree of freedom from spread of infection apparently attained. The cost of treating children as at present in isolation hospitals is very great, and the saving to public funds that would result from the home treatment of all cases of scarlet fever would be an economy very suitable to this period of colossal war expenditure; while, as Dr. Milne points out, the isolation hospitals thus set free would be available for the sick and wounded of the army. Measles, though long regarded as a trivial disease which all children must endure, and one suitable for home treatment, is the cause of very heavy infantile mortality owing to its complications and sequels, and a satisfactory mode of limiting its spread is much to be desired. In this direction it can only do good if Dr. Milne's experiences are widely known and acted on, so as to be effectually tested; but it is well to emphasise the absolute necessity that exists for the earliest possible diagnosis if the method is to be effectively used. It is only by applying the disinfectant treatment at the very outset that spread of infection can be prevented; indeed, the antiseptic treatment should be applied even before a certain diagnosis is arrived at, since it can do no harm in any case, and may, if its author's claims are verified, be of value in both diseases alike. Far more evidence is wanted before Dr. Milne's treatment can be recommended to public bodies as one that they must try, but enough is forthcoming to make investigation and experiment proper.

[1] The Prevention of Infectious Diseases (Scarlet Fever and Measles). By Robert Milne, M.D., C.M Aberd. Printed at Dr. Barnardo's Homes, London, E.

NECROSIS OF HALF A PATELLA.

IN our last issue Major E. Mansel Sympson, R.A.M.C. (T.), described a very interesting case in which after an injury and the formation of an ulcer over one knee the whole of the anterior surface of the patella necrosed and came away. The case is described as unique; this form of necrosis of the patella is certainly very rare, but some similar cases are to be found in surgical literature. The earliest case of the kind was recorded by Daniel Turner in his "Art of Surgery," published near the beginning of the eighteenth century. The patient was a girl, 13 years old, who knocked her knee against a door. Much suppuration followed, and after a long time the superficial part of the patella came away. Turner looked upon it as a peculiar fracture of the patella, but from the account it was certainly a necrosis of the anterior half of the bone. The mode of production in most cases is this: there is first a suppurative inflammation of the bursa patellæ; the inflammation spreads to the underlying periosteum of the patella; thus much of the blood-supply of the patella is cut off from the superficial portion of the bone, with the result that this part of the bone dies. It might be thought that as the anterior surface of the patella is the only surface of the bone covered by periosteum, destruction of this periosteum should cause necrosis of the whole bone, but many small vessels enter the patella on the posterior aspect of the bone below the articular surface, and this blood-supply is quite sufficient to keep alive the posterior half of the bone.

HÆMORRHAGIC VARICELLA.

HÆMORRHAGIC varicella is very rare. In the *Canadian Medical Journal* for July Dr. D. Grant Campbell has reported the case of a healthy infant who was born on Sept. 5th, 1914, and admitted to the Montreal Foundling Hospital. On Jan. 2nd, 1915, a child was admitted and two days later showed a typical eruption of varicella, and was immediately isolated. However, the contagion spread, and most of the infants and one of the nurses acquired the disease. On Feb. 25th the first child showed a few spots of varicella, and two days later her temperature rose to 102·2° F., but fell to normal in less than 24 hours. On March 2nd the temperature again rose suddenly to 102°, and remained elevated until death. On March 3rd the eruption became hæmorrhagic, the pustules forming the centre of small areas a quarter of an inch in diameter, there was a slight vaginal discharge of blood and at intervals all the morning there was epistaxis. At 9 P.M. sharp hæmorrhage occurred from the mouth and nose, fully 6 ounces being lost. Various measures were tried to check the hæmorrhage, with some temporary effect. On March 4th at 9 A.M. the child had a perfectly normal stool, accompanied by a good deal of tarry blood. She died at 11.30 A.M., less than 27 hours from the onset of hæmorrhagic symptoms. At the necropsy

the left external auditory meatus was found filled with bright-red clotted blood, and the same was found in the nostrils. The skin showed lesions of an irregular distribution and of various sizes. The smallest lesions were small bright hæmorrhagic points which were not elevated. On section the hæmorrhagic area was very superficial. The remaining lesions varied in size to about the extent noted in chicken-pox—from 2 mm. to 1 cm. in diameter, and were deep-red, rather firm, and on section contained a blood-tinged fluid. A few of the larger ones showed slight umbilication. There were sub-peritoneal, sub-pleural, and sub-pericardial petechiæ. The mucous membrane of the stomach showed a few fine red points similar to those seen in the skin and serous cavities. In the brain were similar points, which were more numerous at the base and on the inferior surface of the cerebellum. Both middle ears and external auditory canals were filled with clotted blood, but the tympanic membranes were intact. The prognosis of hæmorrhagic varicella is grave; most of the recorded cases have ended fatally.

THE CAUSATION AND TREATMENT OF PELLAGRA.

BEFORE pellagra can be definitely treated the mystery which surrounds the causation of the disease should be dissipated. The view that pellagra is due in some way to the ingestion of maize, sound or unsound, is being gradually abandoned, and the two chief theories which now hold the field are, first, that which regards the malady as the result of an infection by a protozoal parasite transmitted by some insect; and secondly, that which classes pellagra among the deficiency diseases and as being due to the absence or insufficiency of some essential element in the patient's dietary. Many workers are engaged at the present time, particularly in America, in trying to solve the difficult problem of the etiology of pellagra, but so far none of them has been definitely successful. Recently Dr. H. E. Bond, of Jamaica, has summarised the work of various authorities on the subject, and has drawn our attention to a theory that pellagra may be due to a gastro-intestinal auto-infection (or alimentary toxæmia), and that the actinic rays of the sun may assist in the development of the disease. Dr. Bond in his communication discusses the relations of the gastro-intestinal tract as well as of some other organs, such as the suprarenals and the thyroid, to the skin. He then considers the effects of exposure to the actinic rays of the sun, which, he says, can irritate the uncovered surface of the human body and so cause intense hyperæmia, especially in subjects whose vitality has been already lowered from defective innervation. As a result of his studies he has arrived at certain conclusions and opinions which may be briefly stated as follows. Pellagra is an affection akin to Addison's disease. The causal bacterium is in the intestines, as indicated by the amounts of indol and skatol present; and it primarily affects the sympathetic and secondarily the central nervous system. There are factors in the actinic rays of the sun which can irritate the exposed areas of the human skin and intensify the condition. Pellagra should respond to treatment by gastro-intestinal antiseptics, such as calomel, beta-naphthol, or acetozone, administered internally; also by treatment externally with the usual protective ointments, one, for instance, consisting of beta-naphthol, balsam of Peru, and zinc ointment. As regards diet, Dr. Bond recommends the daily administration of ripe bananas, but salt fish is to be avoided. The patient must as far as possible be kept in the shade. These views are to some extent both new and interesting and suggest fresh food for thought; but they will require to have a good deal more evidence adduced in their support before they can be expected to receive the serious attention of pellagra experts. Yet all contributions to this difficult subject from those who have devoted special study to the disease have their value; and if the views of Dr. Bond may seem over-speculative to those who incline to pin their faith to one or other of the recognised theories they should none the less be remembered by those having the suitable clinical opportunities, for in this way only can the theory be tested.

LESIONS OF THE CERVICAL CORD IN THE WAR.

AT a meeting of the Société Médicale des Hôpitaux of Paris M. Pierre Marie and Mme. Athanassio-Bénisty presented an important paper on lesions of the cervical cord in the war. M. Marie has recently drawn attention to the relative benignity of wounds of the cord in the war,[1] especially of wounds of the cervical region, and the necessity for minute attention to the patients. The symptoms observed in wounds of the cervical cord were now described on the basis of six cases. The wounds were usually due to rifle bullets, seldom to a shell explosion. The wound of entry was usually over the anterior border of the sternal head of the sterno-mastoid muscle, opposite the thyroid cartilage, and the wound of exit on the opposite side of the spine. Less frequently there was a seton-like wound on the back of the neck. All the patients said that when hit they felt as if they had been struck with a stick on the back of the neck. They all fell forward and none lost consciousness. Some of them could not speak in the first few minutes. Complete paralysis of the four limbs immediately followed, and several remained in the position in which they fell for hours until they received assistance. Often in the minutes which followed the paralysis involuntary micturition, sometimes accompanied by defæcation, occurred. Pains of variable intensity appeared, usually in a few hours, more rarely in a few days after the patient was wounded. Sometimes they took the form of lightning pains, which radiated from the neck down the upper limbs to the fingers or in the lower limbs from the buttocks to the feet. More rarely there was paræsthesia in the form of a sensation of cold water flowing along the limbs or as if the arms and legs were swollen. In the worst cases the paralysis did not remain complete for more than a few weeks; in the less severe cases it commenced to recede after a few days. As a rule it became confined to half the body, being more intense and tenacious in the arm, which remained paralysed for months. The quadriplegia was thus first reduced to hemiplegia and then to monoplegia. Movements usually first returned in one of the thumbs and then in the foot of the same side. The tendon reflexes were exaggerated, especially on the more paralysed side. The superficial reflexes were abolished or feeble according to the period of examination. The plantar

[1] THE LANCET, July 10th, 1915, p. 84.

reflex was generally extensor. Sensibility was almost always affected and Brown-Séquard's syndrome was present in many of the cases. Sphincter troubles in the form of retention of urine and constipation were frequent. Bedsores always occurred, but healed more or less rapidly according to the care bestowed on the patient. In three cases symptoms of paralysis of the cervical sympathetic enophthalmos, myosis, and contraction of the palpebral aperture were present on the most paralysed side. They might be attributed to either a lesion of the last cervical and first dorsal roots or to a lesion of the cervical sympathetic. The monoplegia persisted for a longer or shorter time before disappearing more or less completely. The whole arm was more or less atrophied. The shoulder and elbow-joints became ankylosed, no doubt from disuse. The practical lesson to be drawn from these cases is that lesions of the cervical cord in war should be regarded hopefully and the patients treated with the greatest care, especially in regard to sphincter troubles and bedsores. They should therefore be transported as rapidly as possible to a permanent hospital. Attention was finally drawn to the fact that the prognosis of wounds of the cervical or lumbar part of the cord, or of the cauda equina, is much better than the prognosis of wounds of the dorsal part. In 25 cases of wounds of the spinal cord appreciable and persistent improvement took place only in wounds of the former regions. This was attributed to the fact that the spinal canal is wide in the cervical and lumbar regions, but narrow in the dorsal, where also the vertebræ are almost immovable. In this the cord is crushed against the bone, when it is not divided by the projectile, while in the other regions it is more easily displaced before the projectile.

AIR RAIDS AND SURGICAL OPERATIONS.

DURING one of the recent air raids on the East Coast a well-known surgeon was performing the operation of tracheotomy at a nursing home when the German aircraft came over the place at night. The town electric current was at once cut off. All the lights went out suddenly, and this, too, at the very moment when the surgeon in question was opening the windpipe. Fortunately, it was not the first attack delivered against this place, a fishing and sea-bathing resort. Taught by experience, the operator had made it a matter of habit to warn his nurses and other assistants that lamps should be kept ready for use during all operations which had to be undertaken at night. This precaution may have saved the small patient's life. With but a trifling delay the tracheotomy was completed and the child, we are glad to report, is now doing well. To have performed so delicate an operation in such circumstances is a considerable feat, for the raid was a serious one, a good many bombs were dropped, several people were killed and injured, and the feeling at the moment was naturally one of intense apprehension. Some of the bombs hit a house in the neighbourhood, the residence of another well-known practitioner. Luckily no one was at home at the time and the medical practitioner got off with the destruction of a certain amount of property. The experience recorded will no doubt insure the taking by medical men generally of the precautions which in this case had been fortunately observed.

SIR FELIX SEMON AND THE INTERNATIONALES CENTRALBLATT FÜR LARYNGOLOGIE.

THE *Internationales Centralblatt für Laryngologie, Rhinologie, &c.*, which was founded by Sir Felix Semon, contained in its issue for June (Jahrgang XXXI., Berlin, Juni, 1915, No. 6) a declaration, of which the following is an accurate translation:—

DECLARATION.

In the *Times* of July 12th there is an open letter from Sir Felix Semon as follows:

To the Editor of the "Times."

Sir,—For many years I believed in the possibility of a better understanding between this country and Germany, and it was a most bitter disappointment to me when the great crash came last year. Even then I hoped that it would suffice for a naturalized British citizen of German extraction loyally to do his duty by his adopted country without making any public expression of his faith. The inhuman methods of German warfare, however, have often and of late with ever-increasing force, induced me to think that it would be right for a German by birth to publicly express his detestation of that policy. What has hitherto deterred me from doing so has been the fear that such a statement might be misconstrued as a desire to personally court favour. But now that Sir Arthur Pinero in the letter published in *The Times* of to-day has pointed out that an attitude of continued silence might be interpreted as "sitting on the gate," I beg to say that I emphatically abhor the barbarous methods, one and all, employed by Germany.—Yours obediently,

Rignalls, Great Missenden, May 11th. FELIX SEMON.

When Sir Felix Semon, surely misled by the lying reports of the Press inimical to Germany, wrote this letter in which he publicly takes a stand against the land of his birth, he must have known that he thereby caused sincere pain and bitter disappointment to his German friends and colleagues. Sensible and farseeing as he is, he surely could not be in doubt for a moment as to the effects which were bound to result for his further relations with everything which connected him with the old Fatherland. Nor could he doubt that the same conditions would apply with regard to his relation with this *Centralblatt*, which he has founded, edited for a quarter of a century and made successful, and which in memory thereof still bears his name. For, although this journal is an international one, intended to transmit the results of scientific work in the *whole* domain of our speciality to the specialists of *all* countries, and although it has always most carefully kept this international character, yet the fact remains, that it is being published in the German language and in the capital of the German Empire.

The Editor and Publisher, who are proud to be Germans, consider it to be further irreconcilable with this fact, that at the head of this journal the name of a man should appear who in a public declaration has sided against their Fatherland, and hence they feel compelled to declare to their keen regret, and whilst still gratefully acknowledging Semon's achievements with regard to this journal, that the name of Semon in the title of the "Centralblatt" will henceforth be omitted.

The Editor and Publisher of the *Internationales Centralblatt für Laryngologie*, Professor Dr. G. FINDER, AUGUST HIRSCHWALD.

The declaration of the Editor and Publisher of the *Internationales Centralblatt für Laryngologie, Rhinologie, &c.*, usually known as "Semon's *Centralblatt*," was probably expected by Sir Felix Semon, but it is an incident of wide bearing, and deserves comment on general scientific grounds. Owing to his frank and brave letter to the *Times*, Sir Felix Semon's name has already been expunged from the list of honorary members of the Vienna Laryngological Society and the Berlin Laryngological Society, and it may be inferred that he will be stripped of his various German, Austrian, and Hungarian honours. But the action of Professor

Finder and Herr Hirschwald in removing the name of Semon from the famous scientific periodical which he founded is on a different plane. Semon's *Centralblatt* was the only international rhino-laryngological journal. It is simply an accident that it is published in Germany, and the deletion of the founder,s name is an international offence. It has been resented as such by the withdrawal from the conduct of the journal of Dr. Emil Mayer, the American collaborator, and of Dr. Peter MacBride, Dr. H. J. Davis, Dr. Logan Turner, and Dr. P. Watson Williams, British editorial contributors who have seen the above "declaration."

It is the duty of Sir Felix Semon's professional colleagues to recognise the sacrifice involved in his open profession of loyalty to our King and country. His three sons are all serving in the British army, and he has certainly endured the painful severance of many social ties. His personal honours and distinctions, received from countries with which we are at war, he can probably spare with equanimity; but he prized his intimate association with an international organ for the promotion of scientific knowledge throughout the world. It seems to us that the action of Professor Finder and Herr Hirschwald, which is certainly *ultra vires*, is also particularly spiteful and boorish.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE CENTRAL COMMITTEE.

A MEETING of the Central Committee was held on Thursday, August 12th. The receipt was announced from the Aide et Protection aux Médecins et Pharmaciens Belges Sinistrés of an acknowledgment of the cheque sent by the Committee on June 12th. Copies were also received of the minutes of meetings of the Central Committee of the Belgian Society, which showed that the state of their assets during June and up to July 8th were satisfactory. The last report received, bringing the accounts up to the beginning of June, showed the Belgian Society to have £750 in hand. By June 10th this had dropped to under £500, but by June 24th the sum in the *caisse* had risen to over £900, at about which figure it was maintained till July 8th, the date of the last minutes received. The minutes showed that the receipts and expenditure seemed to balance very well, as the sum on July 8th was a little larger than the sum in hand in the beginning of May, and no credit had yet been given in the financial statement of the last sum sent in June by the Central Committee. Subscriptions in Belgium, though small, appeared regular, and the sums spent in relief were only granted after close investigation. The chairman said that acting on the authority given by the Committee on July 15th to himself, the secretary, and the treasurer a further sum had been despatched to Belgium, Mr. Hoover advising this course. The Committee decided that in the circumstances no more money would be sent until representations were made from Belgium.

A letter from Dr. Des Vœux, the treasurer, was read saying that he had started for a short holiday and that Dr. Squire Sprigge, the secretary, had agreed to act as treasurer during his absence and as intermediary in obtaining posts for Belgian doctors and pharmacists. Dr. Des Vœux reported that places had been secured now for most of the Belgian refugee doctors, and that there was much less demand for relief in money or kind. He brought the question before the Committee of refunding to its donor, a Belgian pharmacist, a sum of money which that gentleman had expended out of his own pocket on one of the refugees who had already been helped by the Fund. This was an exceptional case, as the lady in question is alone in England. Her father is much respected by both Belgian doctors and pharmacists, and she has worked gratuitously amongst the Belgian refugees for a long time. She now, however, has obtained work in the Censor's office. In the meantime her benefactor has become penniless. The Committee decided to pay a portion of the debt. Dr. Des Vœux's financial statement showed that up to August 11th, 1915, £17.892 had been received. From July 15th to August 12th £2417 2*s.* 3*d.* had come in, including £22 6*s.* 6*d.* bank interest.

THE WEEK'S SUBSCRIPTIONS.

The following subscriptions to the Fund have been received by Dr. Des Vœux:—

	£	*s.*	*d.*
South Australian Belgian Doctors' Relief Fund (per the Agent-General) (third donation, total £500)	100	0	0
Dr. John Stewart (second donation) ...	2	2	0
Dr. G. D. H. Carpenter	1	0	0
Dr. C. G. Maclagan ...	1	1	0

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham-gate, London, S.W., and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Ltd.

THE APPEAL FOR SURGICAL INSTRUMENTS.

Surgical instruments should be sent to the Master of the Society of Apothecaries, Apothecaries' Hall, Blackfriars, E.C.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENTS.)

Scientific Research in India.

THE report of the governing body of the Indian Research Fund Association for the year 1914–15 has been issued. With the close of the financial year 1914–15 the Indian Research Fund Association has completed its fourth year of existence. The association was started originally in 1911 with a grant of five lakhs from the Government of India. The objects for which it was established were the prosecution and assistance of research, the propagation of knowledge, and experimental measures generally in connexion with the causation, mode of spread, and prevention of communicable diseases. It was contemplated that the fund would be supplemented by donations from wealthy and public-spirited persons in India, and that eventually a trust would be formed for its administration under the Charitable Endowments Act (Act 6 of 1890). No private contributions have been received so far, and the fund is at present financed entirely by a recurring annual Government grant of five lakhs and administered by a governing body. During the year the fourth meeting of the governing body of the association was held at Simla on March 31st last. At this meeting the report of the Scientific Advisory Board for 1914–15 was adopted. Members of the board for the ensuing year were appointed, and general sanction was given to the new proposals submitted and to the expenditure involved thereby. The balance at the disposal of the fund on March 31st was Rs.6,05,21695, the total expenditure

since the inspection of the fund being on the same date Rs.14,94,7836-7, out of the total grant of Rs.21 lakhs, including Rs.50,000 for the Central Research Institute and Rs.50,000 for plague experiments in Bangalore made by the Government of India. The Government body are greatly indebted to the members of the Scientific Advisory Board and to the various officers and subordinates who have been employed under their orders. The President (Sir Harcourt Butler) expressed his high appreciation of the excellent work done by the board, the members of the bacteriological department, and other officers employed under the association, and paid a special tribute to the chairman of the board (the Hon. Sir Pardey Lukis, K.C.S.I.) for the clear, practical, and beneficent way in which he has directed research in India, and to Major Norman White for the valuable work which is being done by the *Indian Journal of Medical Research* under his editorship.

Assam Lunatic Asylum.

From the Chief Commissioner's resolution on the working of the Provincial Lunatic Asylum in Assam for the triennium 1912–14, which, together with the report by the Inspector-General of the Civil Hospitals, Assam, is published in the *Assam Gazette*, we find that the number of lunatics confined at the Tezpur Lunatic Asylum during the three years was 298, 303, and 355 respectively. Admissions and re-admissions numbered 66 in 1912, 74 in 1913, and 95 in 1914. The increase in the latter two years was mainly due to the admission of lunatics from Sylhet and Cachar, who used to be sent to Dacca, but have been received at Tezpur from the latter part of 1913. Overcrowding was remedied by provision of temporary accommodation, while a project for reconstructing the asylum buildings at a cost of over three and a half lakhs of rupees has been prepared and work commenced. In spite of the increase in the number of inmates, it is satisfactory to note that the deaths decreased from 47 in 1912 to 17 in 1914, and fatal cases of tuberculosis from 23 to 7. In this connexion it is worthy of mention that in 1914 the rate of mortality amongst the inmates of the asylum was lower than in any province in India.

The Late Lieutenant-Colonel Ewens, I.M.S.

In a Government review of the working of the Punjab Lunatic Asylum for the triennium ended 1914 the following reference is made to the death of Lieutenant-Colonel Ewens, I.M.S.: "Lieutenant-Colonel Ewens, who has held charge of the asylum since its foundation some 15 years ago, died on Sept. 9th, 1914. The Lieutenant-Governor heartily endorses the remarks made in the report and by the Inspector-General of Civil Hospitals on his work as superintendent. The institution owes its progress in efficiency and popularity almost entirely to his untiring efforts and sympathetic care of the inmates, and in him Government has lost a most capable officer and the patients a true friend."

THE HEALTH OF FALMOUTH IN 1914.—The medical officer of health for Falmouth (Dr. A. Gregor) in his annual report for 1914 states that the birth-rate was 18·08 per 1000, an increase over the last three years. The crude death-rate was 13·37 per 1000, the net death-rate being 12·56. The number of deaths under 1 year was at the rate of 69·10 per 1000 births, which was a substantial reduction, and compared favourably with other urban areas.

MEDICAL SERVICE IN THE HIGHLANDS AND ISLANDS.

IN many of the districts within the large area of northern Scotland, known as the Highlands and Islands, the law of supply and demand has never been able to secure an adequate medical service for a poor and sparsely distributed population. This has long been acknowledged by others besides those medical practitioners who with scanty remuneration have struggled to alleviate human suffering in localities where lack of means of communication and locomotion have combined with severity of climate to render their task arduous and sometimes hopeless. State assistance is, however, now rendered more practicable owing to the possibility of extending telegraphic and telephonic communications which the State controls, and owing to the cheapening of vehicles and boats propelled by "motors." Consequently, in a series of explanatory papers now issued by the Highlands and Islands Medical Service Board we naturally find reference to the latter, and one of the documents referred to is devoted entirely to the subject of grants towards the extension of telegraph and telephone facilities. Modern scientific inventiveness has thus aided in bringing about the practical expression by the State of modern sympathy with suffering, as it has promoted and increased public appreciation of medical science and its practitioners.

Reference was made in THE LANCET of July 31st to the report of the Highlands and Islands Medical Service Board covering the period up to the end of last year, and the series of memoranda mentioned above may be regarded as explanations of its future policy from a practical point of view, divided, according to the subjects treated of, into six small pamphlets, which can be bought for ½*d.* each through any bookseller or from the usual official publishers. The first one, A, gives the proposals of the Board with regard to medical practitioners in administering the "Medical Service Fund." This fund has been created, in the words of the Highlands and Islands (Medical Service) Grant Act, 1913, "for improving medical service, including nursing, in the Highlands and Islands of Scotland, and otherwise providing and improving means for the prevention, treatment, and alleviation of illness and suffering therein." It is explained that, whatever other schemes may be in contemplation, the first and most pressing need, in the opinion of the Board, is for the adoption of means whereby an efficient medical service can be brought within the reach of persons of the crofter and cottar class at fees which they can reasonably be expeeted to pay, it being understood that the cost of such medical attendance shall not be increased by reason of distance from the residence of a medical practitioner. The sum of money available for carrying out this and other branches of the Board's scheme is not overwhelmingly large when the task to be performed is taken into consideration. To an annual sum of £10,000 allocated in aid of mileage and other special charges, which has been previously voted, a sum of £32,000 has been added, making a total of £42,000 for the various purposes of the Medical Service Fund. The document (A) to which we are referring sets out in some detail the conditions upon which the payment of grants to medical practitioners is proposed to be made, and touches upon the various other points which unavoidably present themselves for consideration in connexion with the introduction of an important new factor into the business relations between a large class of medical men and their patients. The medical man in poor districts has already under his care many patients the fees for whose treatment do not come out of their own pockets, and the Board has had to declare as its policy that the new grant is for the purpose of improving medical and kindred services and not for relieving those who at present bear, in whole or in part, the cost of those services. The parish council, for example, will have to pay a salary where it paid one before, and the inhabitants of the district will gain by having a better remunerated medical service and one rendered more efficient by speed in methods of locomotion, and improved means for securing prompt attendance. Immediate arrival at the results finally to be achieved is, however, not to be expected; a footnote warns us of the conditions hostile to progress in which we are now living, and explains that districts which in normal times of peace might reasonably

hope to see a medical man established in their midst must be content, for the present, with the help that the board can give in the shape of additional travelling facilities for the existing practitioners.

The important subsidiary topics dealt with in the other explanatory memoranda include (B) the question of nursing, the general conditions being set out under which district nursing associations will be eligible to participate in grants from the Medical Service Fund; and (C) the circumstances in which contributions towards hospitals and for the provision of ambulance services will be granted. The needs of the Highlands and Islands are not, however, confined to the subsidising of medical men and nurses to care for the sick or injured population in their homes, and of ambulances and hospitals so that they can be duly cared for when their homes are unsuitable. Grants have to be considered, and the Board is prepared to make them, towards the provision or improvement of housing accommodation for medical men and nurses. These grants, the conditions of which are set out in Pamphlet D, will be regulated in accordance with the necessity of providing or improving a house in order to render better the medical service of a particular district in which no suitable building exists. Here the coöperation of local authorities will be invoked and model plans for their guidance will be issued by the Board. Again, the circumstances of medical practice in thinly populated and mountainous localities and in islands off the Scottish coast are not favourable to the establishment of "specialised services," a general term applied by the Board to medical consultations, assistance at operations, and the provision of surgical appliances, dentistry, and school clinics. The consideration of these (E) involves the question of the provision of laboratory facilities, the object in view being to bring the practitioner into touch with the laboratories at the great medical schools, instead of leaving him to maintain a small pathological laboratory and to provide his own vaccines, if his individual powers and opportunities should enable him to do so. Finally, the Board has to contemplate the devotion of a strictly limited portion of its funds to the connecting up of the houses of medical men and of nurses, as well as hospitals, with central telephone call-offices and with post-offices where suitable arrangements can be made. In Pamphlet F, which is devoted to the subject, will be found an interesting official communication from the Postmaster-General showing the lines upon which the post-office will aid in the extension of telegraph and telephone facilities where the volume of trade or agriculture is not sufficient by itself to secure the desired privilege.

When we remember that the matters enumerated above have to be considered in relation to a very extensive area it will be seen that the task of the Highlands and Islands Medical Service Board is not simple. We have spoken of the law of supply and demand. The demand is there, in the sense that medical service is urgently needed by a scattered and poor population, but the supply has fallen short because the poverty and sparsity of the population have rendered it impossible for those who would provide medical attendance and nursing to make a decent livelihood by so doing. How far the sum mentioned above may suffice for the purpose for which it has been voted remains to be seen, but there can be no reason why the first experiments in distributing it should not lead to satisfactory results and why those results should not encourage Parliament to further generosity in so worthy a cause.

THE LATE DR. R. FREEMAN, OF PLYMOUTH.—At the last meeting of the Plymouth borough council the mayor stated that the Misses Freeman had presented to the town the silver snuff-box presented by the corporation of Plymouth to their father, the late Dr. Freeman, in recognition of his valuable services during the cholera epidemic in 1832. The snuff-box has the following inscription: "To Richard Freeman, M.D., in testimony of the gratitude and esteem of his fellow-townsmen for his humane and unceasing attention to the poor during the awful visitation of malignant cholera at Plymouth, A.D. 1832." The mayor described the heroic services of the late Dr. Freeman during the epidemic, when 1894 persons were attacked with cholera, and of these 779 died. It was decided to place the box with the museum committee for safe custody and public exhibition.

Public Health.

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

Urban District of Willesden.—Dr. G. F. Buchan's annual report for the year 1914 contains a variety of interesting information. The population of Willesden estimated at mid-summer 1914 was 166,634, as compared with the Census population 154,344 in 1911. The number of births in the district during the year was 4115, giving a birth-rate of 24·7 per 1000 of the population. The birth-rate, which equals that of last year, remains the lowest recorded. There were 1752 deaths in the district during the year, giving a death-rate of 10·51 per 1000, as compared with 10·24 in 1913 and 9·8 in 1910, when the death-rate in Willesden was lowest. The infant mortality rate was 82 per 1000. The number of cases of compulsory notifiable infectious diseases was 1665, which is the highest on record, being due, in the main, to increased prevalence of scarlet fever and diphtheria. The type of diphtheria prevailing was more than usually virulent, and the fatality rate rose to 79 per 1000 cases, which is the highest recorded since 1902, when the fatality rate was 122.

Dr. Buchan gives a brief review of the work which has been done by the council in past years for the improvement of the health of the population, and comments on the results achieved. After alluding to the legal enactments relating to public health which have been passed during the last 40 years, he states: "It would be difficult to assess the exact part that each of the measures passed since 1875 has played in improving the national health, but so far as Willesden is concerned the broad fact is that the death-rate in 1875 was 21·4 per 1000 and in 1914 10·51 per 1000. In other words, if Willesden people had died at the same rate in 1914 as in 1875, 1814 additional deaths would have been recorded. This saving of lives has a commercial value. Dr. Farr in 1876, in the thirty-ninth annual report of the Registrar-General, reckoned that the mean net value of each male person in the community was £150, as estimated by the standard of the agricultural labourer of that day. For the whole population, including females, he thought the standard might be lowered to £110. It should be noted that Willesden is an urban and generally educated community as compared with the agricultural labourer class of 1876, and that consequently these figures understate the value of the unit of the population when applied to Willesden in 1914. But taking the lower figure above given it will be seen that the saving of 1814 lives in 1914, as compared with 1875, means a saving of £199,540 during the year 1914. I do not wish it to be thought that the diminished death-rate is wholly the result of the activities of the council. During the period of 1875–1914 the birth-rate has fallen from 44·7 to 24·7 per 1000 of the population, and this diminution in the birth-rate has led to a reduction in the proportion of persons living under 5 years of age when the death-rate is highest. It should not, however, be deduced from this statement that a high birth-rate is incompatible with a low death-rate, for under normal healthy conditions a high birth-rate would mean that a large proportion of the population were living between the ages of 5 and 45, when the death-rate is lowest. Properly speaking, therefore, and under the best conditions of living, a high birth-rate and a low death-rate are synonymous terms, and it is a matter for consideration under what conditions they may become so. This problem is not easy of solution, but can be simplified by resolving it into three cardinal questions: 1. How can the falling birth-rate be restored to its former level? 2. How can the high death-rates under 5 years of age be diminished? 3. How can the death-rates at ages over 5 years be still further diminished? The first of these questions presents considerable difficulty. An examination of Table 1A of Appendix A, which gives the birth-rates in each ward, shows that these are least in Brondesbury Park and Cricklewood wards, and highest in Stonebridge and South Kilburn—that is to say, the birth-rates are lowest in the best residential areas of Willesden and highest in the poorest, and generally it may be said that the lack of fertility is greatest in the most valuable stocks. The fall in the birth-rate, especially amongst the middle and upper classes, is difficult to explain. It is not wholly explained on

physical, social, or economic grounds, because in a number of instances not one of these causes operates, and yet families are restricted or do not exist. On the other hand, in many cases economic circumstances prevent the rearing of families or of large families, and the time has come when the national interests demand that attention should be given to the problem. Within recent years the idea of large families has not been popular amongst married people. But the position in which the Empire finds itself to-day shows that large families are a national asset of the highest possible importance, and the nation must do what it can to encourage and support them. It is not easy to say how this can best be done. But it has been suggested that it may be desirable to subsidise maternity, or to give a bonus for every child after the second, so as to encourage and enable parents to bring up larger families. Other solutions will no doubt be suggested of this most difficult problem, which requires the concentrated thought and attention of every member of the council and community. The second question, How can the high death-rates under 5 years of age be diminished? can be more easily answered. All the agencies of medical science must be brought to bear on the problem, and the child and expectant mother taken care of." Dr. Buchan then quotes the memorandum of the Local Government Board on the subject and makes certain observations thereon, continuing: "The answer to the third question, How to diminish still further the death-rates at ages over 5 years? is that all measures at present in operation for the improvement and protection of the public health must be continued, and, where necessary, amplified. Greater regard must be paid to the conditions of living of the population, housing conditions, the protection of the food-supply, the milk-supply, the sanitary and hygienic conditions of schools, factories, workshops, shops, offices, and workplaces, and generally every possible measure must be taken and effort made to secure healthy conditions of life and work. If these problems are approached with a full realisation of their importance and the relative responsibilities of individuals, local authorities, and the State, and an earnest desire to act for the public weal, we may look forward to the building up of a race of ever-increasing health and strength, and fully able to resist any strain, physical, moral, or financial, to which it may be put."

County Borough of St. Helens.—Dr. H. J. Cates, in his annual report for 1914, devotes a few paragraphs to a description of the services rendered by him and his department in assisting the local military forces during the early days of the war, and subsequently when the hutment at Garswood Park was under construction. On pp. 59 and 60 of his report the following statement appears: "Soon after the outbreak of war a considerable amount of time was devoted by the medical officer of health in making the necessary arrangements for the medical examination of recruits, particularly those of the St. Helens battalion, and until it became possible to obtain the services of a whole-time officer the duties of medical officer to the battalion were carried out by him. It was decided to find accommodation for the men in disused glassworks at Sutton, and steps were at once taken to erect the necessary sanitary conveniences. Separate pedestal water-closets, each with a flushing cistern, were provided at cost price by the health committee, ample washing facilities, and concreted urinals were constructed under the direct supervision of the medical officer of health. Fortunately the chief sanitary inspector, although on active service, was able to give his time to the work. During the six months that the battalion remained in the glassworks the medical officer of health was responsible for the sanitation of the barracks and of the hutments erected for the unit in Garswood Park. Some further reference may be made to the provision of separate pedestal water-closets for the recruits. In spite of some adverse criticism the civilian committee were strongly advised to adopt the separate water-closet system, and they are to be congratulated on the firm attitude taken up. It was said that the insanitary contrivance known as an earth-closet was the only type of closet suitable for soldiers, and that a water-closet would be a source of recurring nuisance. The result of the experiment has shown that the water-closets were kept scrupulously clean, were regularly flushed after use, were preferred by the men, and were free from any nuisance. A close inspection was kept of the food supplied to the soldiers and of premises in the borough where certain articles of the food were prepared. Regular removal of refuse was carried out by the local authority, water and lighting were supplied from the corporation mains, and ample facilities for free bathing were provided at the public baths. Cases of infectious and contagious diseases occurring among the soldiers were admitted into the borough isolation hospitals, and a very considerable amount of disinfection of clothing and equipment was carried out. The motor ambulance was used on many occasions to convey military patients to the local hospitals, and no charge was made by the local authority. Up to the end of the year there was no instance of any notifiable infectious disease among the troops in the borough." This work was doubtless done by Dr. Cates in connexion with the scheme of coöperation between civil and military authorities which was inaugurated by the Local Government Board and War Office shortly after the outbreak of hostilities, and which, in the unexampled circumstances which have prevailed during the past 12 months, has been of great value in safeguarding the health of the forces and in preventing the spread of infectious disease.

In view of the extensive prevalence of measles in certain parts of the country and of the high death-rate produced among children of the lower classes affected by this disease, it is interesting to note that the health committee of St. Helens decided at the end of the year 1914 to reserve 40 beds in Peasley Cross Isolation Hospital for the treatment of children suffering from measles, and it is to be hoped that Dr. Cates in his annual report for 1915 will record the results attained by this procedure. The infantile mortality rate in St. Helens is high. During the year there were 464 deaths of infants under 1 year of age, giving a mortality rate of 138 per 1000 births. Dr. Cates also reviews at some length the means for preventing mortality in childbirth and infancy.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN the 96 largest English and Welsh towns with populations exceeding 50,000 persons at the last Census, 7985 births and 3986 deaths were registered during the week ended Saturday, August 14th. The annual rate of mortality in these towns, which had been 11·4, 11·4, and 11·3 per 1000 in the three preceding weeks, rose in the week under notice to 11·5 per 1000 of their aggregate population, estimated at 18,136,180 persons at the middle of last year. During the first six weeks of the current quarter the mean annual death-rate in these towns averaged 11·5, against 11·2 per 1000 in London. The annual death-rate last week ranged from 4·1 in Gloucester, 5·3 in Coventry, 5·9 in Hornsey and in Swindon, 6·3 in Ilford, and 6·8 in Enfield, in Smethwick, and in Aberdare, to 16·4 in Bootle, 17·1 in Rochdale, 17·3 in Middlesbrough, 17·5 in Stoke-on-Trent, and 19·3 in Barnsley.

The 3986 deaths from all causes were 72 in excess of the number in the previous week, and included 441 which were referred to the principal epidemic diseases, against 346 and 393 in the two preceding weeks. Of these 441 deaths, 262 resulted from infantile diarrhœal diseases, 86 from measles, 33 from whooping-cough, 32 from diphtheria, 21 from scarlet fever, and 7 from enteric fever, but not one from small-pox. The mean annual death-rate from these diseases was equal to 1·3, against 1·1 per 1000 in the previous week. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had increased from 67 to 202 in the six preceding weeks, further rose to 262 last week, of which 59 were registered in London, 29 in Liverpool, 16 in Hull, 15 in Manchester, 11 in West Ham, and 9 each in Birmingham and Leeds. The deaths referred to measles, which had steadily declined from 239 to 70 in the ten preceding weeks, rose to 86 last week, and caused the highest annual death-rates of 1·2 in Derby, 1·3 in Norwich and in Rhondda, 1·5 in Sheffield, 3·0 in West Bromwich, 4·3 in Lincoln, and 4·8 in Barnsley. The fatal cases of whooping-cough, which had been 42, 39, and 42 in the three preceding weeks, fell to 33 last week, and included 9 in London and 6 in Liverpool. The deaths attributed to diphtheria, which had been 43, 33, and 46 in the three preceding weeks, declined to 32 last week, of which 7 occurred in London and 3 in Stoke-on-Trent. The deaths referred to scarlet fever, which had been 30, 23, and 20 in the three preceding weeks, were 21 last week, and included 5 in London and 2 each in Stoke-on-Trent and South Shields. The fatal cases

of enteric fever, which had been 9, 9, and 13 in the three preceding weeks, fell to 7 last week, of which 2 belonged to Portsmouth.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had been 2483, 2431, and 2436 at the end of the three preceding weeks, fell to 2415 on Saturday last; 279 new cases were admitted during the week, against 342, 294, and 285 in the three preceding weeks. These hospitals also contained on Saturday last 1155 cases of diphtheria, 59 of enteric fever, 51 of measles, and 8 of whooping-cough, but not one of small-pox. The 1009 deaths from all causes in London were 73 in excess of the number in the previous week, and corresponded to an annual rate of 11·6 per 1000. The deaths referred to diseases of the respiratory system, which had been 126, 103, and 112 in the three preceding weeks, rose to 129 in the week under notice, and were 13 in excess of the number registered in the corresponding week of last year.

Of the 3986 deaths from all causes in the 96 towns, 208 resulted from different forms of violence and 363 were the subject of coroners' inquests, while 1224 occurred in public institutions. The causes of 44, or 1·1 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Leeds, Bristol, West Ham, Bradford, Newcastle-on-Tyne, Nottingham, and in 71 other smaller towns. Of the 44 uncertified causes of death, 8 were registered in Liverpool, 6 in Birmingham, 4 in Stoke-on-Trent, 3 in Gateshead, and 2 each in London, Gillingham, Southend-on-Sea, Dudley, Manchester, Preston, Hull, and Sunderland.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,345,500 persons at the middle of this year, 1002 births and 565 deaths were registered during the week ended Saturday, August 14th. The annual rate of mortality in these towns, which had been 14·2, 13·8, and 13·7 per 1000 in the three preceding weeks, further declined to 12·6 per 1000 in the week under notice. During the first six weeks of the current quarter the mean annual death-rate in these towns averaged 13·8, against 11·5 per 1000 in the large English towns. Among the several towns the death-rate last week ranged from 5·9 in Clydebank, 8·3 in Coatbridge, and 8·9 in Kirkcaldy to 13·9 in Glasgow, 14·3 in Leith, and 15·5 in Ayr.

The 565 deaths from all causes were 50 fewer than in the previous week, and included 91 which were referred to the principal epidemic diseases, against numbers declining from 98 to 79 in the three preceding weeks. Of these 91 deaths, 32 resulted from measles, 29 from infantile diarrhœal diseases, 20 from scarlet fever, 6 from diphtheria, 3 from enteric fever, and 1 from whooping-cough, but not one from small-pox. The annual death-rate from these diseases was equal to 2·0, against 1·3 per 1000 in the large English towns. The deaths attributed to measles, which had been 40, 46, and 33 in the three preceding weeks, were 32 last week, and included 20 in Glasgow, 6 in Paisley, 3 in Edinburgh, and 2 in Aberdeen. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 21, 19, and 21 in the three preceding weeks, further rose to 29 last week, of which 16 were registered in Glasgow, 4 in Dundee, and 3 each in Edinburgh and Greenock. The fatal cases of scarlet fever, which had been 14, 13, and 9 in the three preceding weeks, rose to 20 last week; 10 deaths belonged to Glasgow, 4 to Aberdeen, and 2 to Edinburgh. The deaths attributed to diphtheria, which had been 8, 7, and 3 in the three preceding weeks, rose to 6 last week, of which 3 occurred in Edinburgh. The 3 deaths referred to enteric fever were recorded in Glasgow, Dundee, and Paisley respectively, and the fatal case of whooping-cough in Ayr.

The deaths referred to diseases of the respiratory system, which had been 72, 46, and 70 in the three preceding weeks, fell to 56 last week, and were 7 below the number recorded in the corresponding week of last year. The deaths from the several forms of violence numbered 26, against 29 and 21 in the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the 27 town districts of Ireland, with an aggregate population estimated at 1,212,380 persons at the middle of this year, 541 births and 339 deaths were registered during the week ended Saturday, August 14th. The annual rate of mortality in these towns, which had been 14·7, 14·1, and 11·9 per 1000 in the three preceding weeks, rose to 14·6 per 1000 in the week under notice. During the first six weeks of the current quarter the mean annual death-rate in these towns averaged 13·5, against corresponding rates of 11·5 and 13·8 per 1000 in the English and Scotch towns respectively. The annual death-rate last week was equal to 16·4 in Dublin (against 11·6 in London and 13·9 in Glasgow), 12·7 in Belfast, 17·0 in Cork, 21·5 in Londonderry, 14·9 in Limerick, and 15·2 in Waterford, while in the 21 smaller towns the mean rate was 12·3 per 1000.

The 339 deaths from all causes were 62 in excess of the number in the previous week, and included 40 which were referred to the principal epidemic diseases, against 31 and 24 in the two preceding weeks. Of these 40 deaths, 18 resulted from infantile diarrhœal diseases, 10 from whooping-cough, 8 from scarlet fever, and 2 each from measles and diphtheria, but not one from enteric fever or from small-pox. The mean annual death-rate from these diseases was equal to 1·7, against corresponding rates of 1·3 and 2·0 per 1000 in the English and Scotch towns respectively. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 7, 16, and 13 in the three preceding weeks, rose to 18 last week, of which 11 were registered in Dublin, 6 in Belfast, and 1 in Londonderry. The deaths referred to whooping-cough, which had been 9, 8, and 4 in the three preceding weeks, rose to 10 last week and included 4 each in Dublin and Londonderry. The 8 fatal cases of scarlet fever were 5 in excess of the average in the earlier weeks of the quarter, and comprised 3 each in Belfast and Sligo and 2 in Dublin. The 2 deaths from diphtheria occurred in Dublin and those from measles in Dublin and Belfast.

The deaths referred to diseases of the respiratory system, which had been 36, 36, and 26 in the three preceding weeks, rose to 40 in the week under notice. Of the 339 deaths from all causes, 115, or 34 per cent., occurred in public institutions, and 7 resulted from different forms of violence. The cause of 16, or 4·7 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest; in the 96 large English towns the proportion of uncertified causes did not exceed 1·1 per cent.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE undermentioned has been granted a temporary commission as Surgeon in His Majesty's Fleet:—Dated August 7th: Harry Somerville Martyn.

The following appointments have been notified:—Surgeons: E. L. Atkinson to *Europa*; W. F. Beattie to the *St. Vincent*; J. A. B. Snell (temporary) to the *Duke of Edinburgh*; and E. Granger (temporary) to *Collingwood*. Temporary Surgeon: R. W. Townley to the *Hindustan*.

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel Hubert A. Bray, from the Seconded List, is restored to the establishment (dated July 29th).

John Mitford Atkinson to be temporary Major (dated July 26th).

Basil William Housmann is granted the temporary rank of Major while serving with the 2nd Birmingham War Hospital (dated May 31st).

Captain J. W. Nunn relinquishes his temporary commission on ceasing to be employed with the Duchess of Westminster's War Hospital (dated July 17th).

The undermentioned are granted temporary rank while serving with the 1st Birmingham War Hospital:—Dated May 1st: Lieutenant-Colonel: Alexander Canning Suffern. Dated May 31st: Major William John Orr.

Captain Reginald Cecil Morley Hoare, South African Army Medical Corps, to be temporary Captain (dated July 3rd).

Temporary Lieutenant Gerald S. Samuelson (Captain, Australian Army Medical Corps) to be temporary Captain (dated August 18th).

The undermentioned to be temporary Lieutenants:—Dated May 30th: James Graham Willmore. Dated June 19th: Hugh George Hobson. Dated July 13th: Oliver John Francis Campbell Greenidge. Dated July 26th: Lancelot Horsley, Colin McKean Craig, John McIlrath Gibson, Arthur Hubert Watson, Andrew Hegarty, George Oscar Jacobsen, Geoffrey Plumpton Wilson, Joseph Wallace, Archibald Chalmers, Charles Mitchell, John Simpson, Anthony Bridges Jesser Goope, John Theobald Murphy, Eric Underhill, Frederick James Purcell Daly, Stephen Forrest, James Fleming Dow, Bruce Malaher, Percy James Kelly, Harry Fleming Hutchinson, and Andrew Campbell Keay. Dated July 27th: John White and Charles Baird Macdonald.

The undermentioned officers of the Canadian Army Medical Corps to be temporary Lieutenants:—Dated July 20th: Captain Frederick Henry Bowen. Dated July 21st: Captains Ross Millar and Arthur Edward Lundon. Dated July 20th: Lieutenants: George Robert Douglas Lyon, Livingston Gilbert Geenne, Charles Christopher Gibson, Ivan Dwight Hayes, Seeyman Laird Alexander, Roy Douglas Nasmyth, William Adams Smith, Ivan Wilson, Thomas Campbell, Frederick William Hart, William Robert Tutt, Francis Joseph Ellis, Frederick

Samuel Pope, James Giles Robinson Stone, Roderick John Gordon, James Angus Doull, George B. Kennedy, Frank Russell Hassard, George William Anderson, Harold Sinclair Tait, William Bodden Honey, Frederick Anson Keillor, William Albert Proud, Philip Quesnel, Henry Howard Planche, Arthur William McArthur, Charles Verge, Gordon Earle Richards, Robert Roy Paul, Robert John Percival McCulloch, Edward Sheffield, William Anderson Henderson, Reginald Paul, Robert John Kel, Wilbert Cecil Swenerton, Winfred Smythe Macdonell, Lloyd Remington Meech, Thomas Hugh Lunney, Roland Wilbur Young, Gerald Belfie, Albert Thomas Bond, William Joseph Hicks, Alexander Thomas Embury, George Alonzo Simmons, George Kalichman, and William Hall. Dated July 21st: Charles Thomas Galbraith, John Adam Creighton, James Adam Proudfoot, William Vernon Coffyn, George T. O'Donnell, Daniel Angus McAulay, and Victorien D. Desrosiers.

The undermentioned temporary Lieutenants relinquish their commissions:—Dated August 4th: James B. Anderson, Thomas E. A. Carr, James G. B. Coleman, Edgar Ashby, John F. Gill, and Ellis T. Evans. Dated August 6th: John M. Fry.

SPECIAL RESERVE OF OFFICERS.

Supplementary to Regular Units or Corps: Royal Army Medical Corps.

Cadet John Elvin Rusby, from Leeds University Contingent, Officers Training Corps, to be Lieutenant (on probation).

TERRITORIAL FORCE.

Royal Army Medical Corps.

1st Southern General Hospital: To be Lieutenants: George Joughin and Koch Harry Gill.

2nd Southern General Hospital: Alfred George Timbrell Fisher to be Captain on the permanent personnel.

2nd Western General Hospital: Graham Miles Benton to be Captain, whose services will be available on mobilisation. James Gladstone McKinlay to be Lieutenant.

3rd Western General Hospital: To be Lieutenants: Rhys Trevor Jones and Cornelius Charles Boyle.

3rd South Midland Field Ambulance: The transfer of Lieutenant James G. McLannahan to the 2nd Southern General Hospital is cancelled.

3rd London General Hospital: To be Lieutenants: Walter Henry Lloyd, Harry Guy Mallam (late Surgeon-Captain, Sussex and Kent Bearer Company) and Lieutenant George Finch, from Attached to Units other than Medical Units.

2nd Scottish General Hospital: Cadet John Watson Simpson, from Edinburgh University Contingent, Senior Division, Officers Training Corps, to be Lieutenant.

Welsh Casualty Clearing Station: Robert Thomas Hughes (late Major, Welsh Divisional Train, Army Service Corps) to be Major (temporary).

1st Lowland Field Ambulance: Captain Alford W. Anderson, 5th (Dumfries and Galloway) Battalion, The King's Own Scottish Borderers, to be Major (temporary).

3rd Lowland Field Ambulance: James Wilfred George Hewat Riddel (late Second Lieutenant, 1st Lowland Brigade, Royal Field Artillery) to be Lieutenant.

Attached to Units other than Medical Units.—James Farquhar (late Captain, 10th Battalion, The Manchester Regiment) to be Captain. Captain Arthur E. Gladstone resigns his commission on account of ill-health. The seconding of Captain Haldinstein D. Davis is cancelled. Lieutenant George MacL. Levack, from 3rd Highland Field Ambulance, to be Lieutenant. Lieutenant Joseph B. McKay resigns his commission on account of ill-health.

THE Metropolitan Asylums Board are facilitating the obtaining by medical practitioners of a Diploma in Public Health by providing at certain of their institutions instruction in hospital administration. A three months' course of lectures and demonstrations in hospital administration will be given at the undermentioned hospitals on the days and at the times stated below: 1. North-Western Hospital, Lawn-road, Hampstead, N.W. (Dr. J. MacCombie, medical superintendent), Mondays and Thursdays at 5 P.M., beginning Monday, Oct. 4th. 2. Grove Hospital, Tooting-grove, Tooting Graveney, S.W. (Dr. J. E. Beggs, D.P.H., medical superintendent), Mondays and Thursdays at 5 P.M., beginning Monday, Oct. 4th. The fee for the course is £3 3*s.*, and cheques should be made payable to the "Metropolitan Asylums Board." All information can be obtained from Mr. T. Duncombe Mann, Clerk to the Board.

Correspondence.

"Audi alteram partem."

ACETONE BODIES IN THE URINE.

To the Editor of THE LANCET.

SIR,—In an interesting communication by Dr. B. Derham, published in THE LANCET of July 31st, on the Signification of Acetone Bodies in the Urine, there are some statements made which appear to me to require correction, and which, if allowed to pass unchallenged, would mislead practitioners. Accordingly I venture to make a few remarks thereon, and, for the sake of brevity, select one or two paragraphs for comment.

1. Dr. Derham says that:—

> It should not be forgotten that the tests usually employed for acetone are also tests for aceto-acetic acid, and do, in fact, more certainly indicate the presence of the latter than the former constituent in the urine.

In order to distinguish between these two bodies Dr. Derham states that:—

> The ferric chloride test is not satisfactory; it does not distinguish between acetone and aceto-acetic acid, and produces a dense cloud of precipitated phosphates. ..... Lastly, the test is not a very delicate one, and considerable quantities of aceto-acetic acid may be present without the test affording any indication of the fact.

Here two questions may be asked: 1. Has Dr. Derham tried the effect of ferric chloride upon pure acetone? 2. What evidence can be adduced that the ferric test for aceto-acetic acid is deficient in delicacy? The relation subsisting between the three bodies (conventionally styled "acetone bodies") referred to in Dr. Derham's paper is this:—

β-oxybutyric acid ⟶ Aceto-acetic acid ⟶ Acetone.[1]

Acetone is neutral in reaction and it is inexact to refer to the three compounds as "these various acids." β-oxybutyric acid very rarely occurs alone (Stadelmann's case), and there is no simple or direct clinical test for it available at present.

It is incorrect to state that ferric chloride fails to distinguish between acetone and aceto-acetic acid. Acetone yields no colour-reaction with ferric chloride. Aceto-acetic acid and its salts give a violet red with ferric salts (Gerhardt's test). In the urine the colour is usually a bright claret-red, and the colour is discharged by continued boiling (distinction from salicylic acid). G. O. Mayer recommends as reagent a mixture of liquor ferri perchloridi and solution of sodium chloride (1 in 3), and I find that this works well.

2. Nitro-prusside of sodium in alkaline solution is a valuable reagent (Legal) and gives colour-reactions with oxybutyric acid, aceto-acetic acid, acetone, and creatinin. Dr. Derham states:—

> If a sample of urine gives a reaction with nitro-prusside of sodium, acetone bodies are present.

This sentence, taken by itself, is misleading because it ignores creatinin, a constant constituent of urine. It is, however, easy to distinguish between creatinin and acetone: (*a*) Creatinin gives a bright red with nitro-prusside and liquor potassæ or liquor sodæ; with liquor ammoniæ only a yellow or yellowish-red. (*b*) Acetone with nitro-prusside and liquor ammoniæ (Rothera) develops a ruby red, which gradually deepens in intensity and then

[1] Cf. an excellent paper by Dr. E. L. Kennaway, Guy's Hospital Reports, vol. lxvii., 1913, p. 161.

passes into yellow. The red colour is quickly destroyed by heat. If to the red solution excess of acetic acid be added the colour becomes purple-red, gradually changing to violet or blue.

There are other points in Dr. Derham's paper which invite criticism, but upon which I do not now propose to touch.

A few words in conclusion as to the pathogeny of aceto-acetic acid. Dr. Derham is disposed to hold that—

> A perverted metabolism has nothing to do with the production of aceto-acetic acid and its excretion in the urine, but that the seat of its manufacture is the intestinal canal, and its cause an unhealthy and irregular fermentation of the sugars and starches contained therein.

Now it is clinically possible that acetone bodies might originate from any or all of the three main classes of foodstuffs. But the balance of evidence goes to show that ordinarily they come from the metabolism of fats, and, in severe cases of diabetes, probably also from proteins. Acetone bodies may be eliminated in large quantities while the patient is on a diet almost free from carbohydrates.

I am, Sir, yours faithfully,

WALTER G. SMITH, M.D. Dub., F.R.C.P. Irel.,
President, Royal Academy of Medicine, Ireland.

Dublin, August 12th, 1915.

MEDICAL ORGANISATION AND THE WAR.

To the Editor of THE LANCET.

SIR,—I notice from the leading article in your issue of June 12th that proposals are being made outside the War Office to have an "Advisory Committee" to advise on treatment of disease and organisation of hospitals. When closely considered this is a proposal to put a non-military surgeon, a non-military physician, and a non-military bacteriologist to direct the treatment of disease—in short, a Junker committee to rule in Prussian fashion the whole medical services—a staff to direct the treatment of cases which they do not see. It must not be forgotten that all these three men may have "fads," as medicine is full of such faddists. Are they necessary? If they are necessary it is a very grave indictment on British medicine. The senior medical officer of a hospital should know the special aptitude of the officers put at his disposal. It is his business to select the cases as they arrive and to send each officer the cases suited to his aptitude. What more than this can the proposed committee do?

As to treatment it is plain that there has been nothing new evolved in the treatment of disease during this war but a very considerable reversion to antiseptic surgery. I should say that one discovery has been made—viz., that shell wounds are liable to be followed by tetanus, and that tetanus antitoxin administered early is a prophylactic. Anyone familiar with the general surgery of accidents in India or with the Fourth of July fireworks effects in America discovered this long ago and would naturally have acted on it throughout. We have to keep steadily in mind that the officer in charge of cases has to use his judgment on each case and to treat it according to circumstances, no two cases being treated on a stereotyped plan laid down by anyone—whether advisory committee or not. He is responsible to the patient and to himself and any committee which interferes between them will not be acting in the best interests of the patient. If the officer himself wants a consultation he asks it from one of the many officers in his hospital in whom he has confidence, in which case they see the patient in reality as distinguished from one on paper, which makes all the difference. The whole tendency of an advisory committee would be to eliminate the judgment and initiative of the individual and to subordinate both to a medical junkerdom, the result of which would be bad and very distasteful to proud capable medical officers.

I am, Sir, yours faithfully,

HENRY SMITH,
Amritsar, India, July 23rd, 1915. Lieutenant-Colonel, I.M.S.

CEREBRO-SPINAL MENINGITIS.

To the Editor of THE LANCET.

SIR,—I have read in your issue of April 3rd an article on Cerebro-spinal Meningitis by Mr. E. Norman Butler, in which he has been kind enough to make reference to a paper by Dr. Philip H. Ross and myself on the same subject, more especially with reference to its treatment with soamin, and I beg that you may afford me the privilege of replying through your columns. Mr. Butler states that I claim "that the drug is excreted into the cerebro-spinal fluid." I quote what I expressed: "It (i.e., lumbar puncture) probably invites the entrance of antibodies into the spinal canal by creating a negative pressure and helps the action of soamin which has been injected into the buttock immediately after lumbar puncture." Mr. Butler deplores the absence of a lumbar puncture needle, and no doubt would have used one had he had one, but suffice it to say he did not possess one and did not perform one single lumbar puncture. He could not therefore know anything regarding the effects, good, bad, or indifferent, of this procedure and soamin on the course of the disease or on the cerebro-spinal fluid. How, without performing lumbar puncture, Mr. Butler expected the full therapeutic influence of soamin to penetrate into a cerebro-spinal space turgid with fluid under high pressure we do not quite understand. A certain amount probably does penetrate, varying with the existing pressure, but we prefer to definitely aid its action by performing lumbar puncture.

I have studied his figures carefully and have drawn up a table with the object of testing the accuracy of the methods on which he based his views with regard to this line of treatment, and hope to show that these cannot be taken seriously, for an extraordinary quantity of soamin seems to have been given in a very short time to a small number of patients. The epidemic was of six weeks' duration and the cases, according to his own description, occurred somewhat in this order. I am, however, quite open to correction.

—	A			B			—
	1st week.	2nd week.	3rd week.	4th week.	5th week.	6th week.	
Days ...	1234567	1234567	1234567	1234567	1234567	1234567	
Cases ...	1-11222	1422322	1422222	2322222	1212111	1--1---	Total = 66
Totals per week	9	16	15	15	9	2	
		40			26		
	All untreated except a few which I estimate at not more than 10.			We must suppose that all these were treated, as "35 odd" cases received soamin.			

Of the 40 under A at least 50 per cent. without doubt died within a few days. Let us say 10 recovered and did not need soamin and 10 lived

long enough to come under B. Of the 26 under B, stated to be of less virulent type, let us say about two-thirds recovered, the rest, say 9, died within an average of six days. Of the remainder—i.e., 17—with the case-incidence diminishing, some 10 would occur during the fourth week, 5 during the fifth week, and we are definitely told 2 during the sixth week.

My estimation of the number of injections is therefore as follows:—

Under A	10 during three weeks injected on alternate days, 10 × 10	100
,, B	9 died within six days, 9 × 3	27
	10 cases which occurred during the fourth week received on an average seven injections each, 10 × 7	70
	5 during the fifth week, 5 × 4	20
	2 during the sixth week, and during which all the patients, &c., were returned to Uganda	2
	Total number of injections	219

Mr. Butler claims to have given upwards of 300 injections, shall we say 310, of soamin grs. v. on alternate days, and he injected some "35 odd" within three weeks. We would find it instructive to know how he accomplished this, as throughout the above estimations the numbers have been placed on the big side to be as fair as possible in dealing with his figures, and allowing that all those that survived received injections on alternate days in a mechanical fashion, from the end of the third week onwards, and from the time of their admission to the time of their discharge.

The amount of soamin used appears to have been 310 × 5 grs.—i.e., nearly 3½ oz. Now on going over our own published tables one finds a total of 143 cases admitted, some 7 were treated entirely by serum, the rest with soamin, yet not more than 311 intramuscular injections were administered—approximately the same number as Mr. Butler used in "35 odd" cases. Here alone there appears to be a decided difference in our methods of treatment.

In another part of his paper the following statement is made: "At this stage, three weeks after the outbreak of the epidemic, the general run of cases showed a tendency to diminution of virulence according to the standards above set, for the coma lasted a shorter time and death became less inevitable." Strangely enough, this period synchronises exactly with the time during which he "made the exhibition of soamin a routine measure." Mr. Butler, however, explains this in the following manner: "Parallel with the rise and fall of case-incidence ran the virulence and acuteness of the attacks." Then writing of lumbar puncture he states: "Though from previous experience of its use in cases of post-basic meningitis I very much doubt its efficiency as a therapeutic measure." Regarding this, I would merely inquire whether "thick creamy yellow pus" is not a sufficient indication.

I would further remark as regards his ideas on the local epidemiology of epidemic cerebro-spinal meningitis that it is rather premature to talk of what "usually" takes place, seeing that this disease has for the first time been definitely recognised in British East Africa only as lately as May, 1913, before which neither "epidemic" nor "endemic" cases were recorded. During that year the existence of this epidemic was established by Ross and myself, and there is no reason to suppose that it has yet entirely extinguished itself. No other epidemic has previously taken place so far as is known, though, as I have already stated elsewhere, credit is due to Dr. Haran, now deputy principal medical officer, then medical officer, Native Hospital, Nairobi, for having recorded in his post-mortem returns five cases and six cases during 1906 and 1907 respectively. Dr. Haran did not state or prove that these were epidemic or endemic cases, due to the diplococcus intracellularis, still I cannot but believe that he had a shrewd suspicion of what their exact nature might be, and it is unfortunate that he did not draw sufficient attention to the value of his observations, for there are not many in these parts of the world who devote their energies to routine post-mortem examinations. I do not know whether Mr. Butler has read the paper published by Ross and myself in the Transactions of the Society of Tropical Medicine and Hygiene, vol. vii., No. 2, pp. 83–95. Personally I doubt if he has, but I hope that those who may have done so do not think that our opinions have been founded on haphazard or thoughtless work. Every available case, 142 hospital cases alone, was punctured. Further, 21 repunctures were performed for the special purpose of studying the effects of soamin and serum on the organisms in the cerebro-spinal fluid, both by microscopical and cultural methods. A total of 40 venipunctures was performed and 5 c.c. of blood from each incubated in bouillon, with positive results in 45 per cent. Growth was also attempted from six samples of urine. Intravenous inoculations of monkeys from cases of meningococcal septicæmia were also tried. All the cerebro-spinal fluids, blood, &c., were sent to the Government laboratory, and the whole of the bacteriological work in connexion with these was performed by Dr. Ross, now Director of Laboratories, who is somewhat known as an accurate, experienced, and astute observer. I mention these facts to show that our research was conducted on recognised and methodical lines, and demands a certain amount of consideration.

Nowhere have we stated, and we hope this impression has not been formed by our readers, that it is only necessary to inject soamin in any case of meningitis for a recovery to result. On the contrary, soamin needs to be used in an intelligent manner and not mechanically poured into patients on alternate days. No therapeutic agent that we are aware of is capable of being judged by so high a standard as that which Mr. Butler implies. There are cases of meningitis that will recover with no treatment whatsoever; others to be given a chance must have lumbar puncture performed; but what we meant to convey in our paper, and we therefore published the details of our work in a comprehensive table, was that soamin, used together with symptomatic treatment, in which as regards meningitis we include lumbar puncture, is a valuable therapeutic preparation and that from our experience there is every reason confidently to believe that it saves a certain proportion of cases that would otherwise terminate fatally—no sensible man can expect much more than this. We have no objection to fair and competent criticism, but criticism offered by a person who has not done even a hundredth part of the work that we have, and whose methods are so obviously dissimilar to our own, is out of place.

Furthermore, I would say that our work has been openly performed and from time to time before some 15 of our colleagues. Our methods have, moreover,

been subjected to the scrutiny of no less an authority than Professor W. J. R. Simpson, whose experience of epidemic meningitis dates back to 1882, when he worked on an epidemic at Calcutta. Among the above I also include Mr. Butler, to whom I extended all the advice, however inadequate it may have been, regarding diagnosis and treatment that was at my disposal, with reference to such of the identical cases of which he writes as occurred at Mombasa during the latter half of 1914. During that period he was invited to see my cases of meningitis, and I further to accommodate him admitted some, if not all, of his into my hospital. The epidemic which occurred at Magadi and which he describes as the second epidemic, took place subsequently to this.

As I feel strongly that the method of treatment suggested in our paper is of value, I am tempted to make rather extensive demands on your space, since Mr. Butler's publication in so authoritative and widely distributed a journal as yours will attain much wider publicity than did ours in the Transactions of the Society of Tropical Medicine and Hygiene. We, as tropical workers, presented our paper at one of the meetings of this society.

I am, Sir, yours faithfully,

J. O. SHIRCORE, M.B., M.R.C.P. Edin.,
Medical Officer, East Africa Medical Service.

Mombasa, June 16th, 1915.

MEDICAL STUDENTS AND COMBATANT COMMISSIONS.

To the Editor of THE LANCET.

SIR,—On the strength of an answer given by Mr. Tennant in the House of Commons the authorities in medical schools have advised the students to remain there until they are qualified instead of joining the Forces. Contrary views have, however, been expressed, and on account of this uncertainty I have been asked by several students to obtain an authoritative statement from the War Office. These students are quite willing to become recruits if their services are needed, but they do not like the idea of being forced to do so later, if and when universal service is adopted, while they have a chance now of joining the Forces voluntarily. I therefore wrote to the Secretary of State for War and ventured to express my own opinion that medical students, like munition workers, should not be called upon to go to the front; for medical men will be urgently needed in the future for both the civil and combatant population.

I append the reply I have received from Lord Kitchener's secretary; it will be seen that he views the matter less widely than I do, but although I regret his decision, it is only right that medical students should know exactly how the War Office regards the question.

I am, Sir, yours faithfully,

W. D. HALLIBURTON.

King's College, London, August 16th, 1915.

[ENCLOSURE.]

DEAR SIR,—Lord Kitchener desires me to say in reply to your letter of the 1st inst. that it is advisable for medical students in their fourth and fifth years to continue their studies with a view to qualifying as soon as possible. The War Office would be unwilling to suggest that junior students should be discouraged from taking combatant commissions.

Yours very truly,

H. J. CREEDY,
Private Secretary.

11th August, 1915.

HÆMOPTYSIS DUE TO HIGH TENSION.

To the Editor of THE LANCET.

SIR,—In a paper under this heading appearing in THE LANCET of August 14th Dr. F. de Havilland Hall calls attention to an interesting group of cases of non-tuberculous hæmoptysis associated with high tension. Such cases, although, of course, comparatively uncommon, are, I venture to think, less rare than our text-books would lead us to suppose. Sometimes the hæmoptysis is the first thing to call attention to the coming trouble, as in the following case. A medical man, 43 years of age, leading a very strenuous life as a busy practitioner, consulted me in June, 1905, on account of slight hæmoptysis which recurred each morning on rising. It became rather more copious and occurred at other times also. There was no evidence of pulmonary or cardiac disease, no albuminuria, and no tubercle bacilli in the sputum. He was a heavy smoker and had some chronic pharyngitis. I diagnosed a non-tuberculous hæmoptysis, probably arising from the upper parts of the air-passages. The patient was in a state of great alarm about himself, and was quite convinced he had either tuberculosis or an aneurysm, particularly the latter. In his anxiety he consulted many colleagues, both general practitioners and specialists. This is one of the privileges of our profession when sick; in this instance it had its disadvantages, for he received many varying opinions, including a definite localisation of a tuberculous focus in the left lung. Eventually he determined to assume that it was tuberculosis, and went to a well-known health resort on the coast for rest and treatment. The physician who attended him there made the diagnosis of "gouty" hæmoptysis, and was quite clear that it was not tuberculous. This term "gouty" rather surprised me at the time, as the patient had never suffered from gout. It was fully justified, however, for he had a typical attack four years later. A hæmoptysis continued off and on for about two months, then ceased entirely. The patient improved in every way and returned home. On his journey he took the opportunity of consulting a well-known and much respected specialist in London, who wrote me a very clear and, as events have proved, far-seeing opinion that the patient was suffering from commencing arterio-sclerosis, of which a slightly raised blood pressure and the past hæmoptysis were the only definite evidence. The patient, carefully dieted and taking more leisure than before, was able to continue his practice for about six or seven years. As time went on, however, he began to fail. In 1909 he had an attack of gout, and his blood pressure was usually above 200 mm. Hg. In 1910 his sight began to fail, and extensive retinal changes developed. Cerebral symptoms gradually followed, aphasia, &c., and he died from a cerebral hæmorrhage in 1914, nine years after the hæmoptysis.

When, in an apparently healthy person in the prime of life a hæmoptysis suddenly appears, it is a somewhat grave responsibility to say that it is not the herald of a coming tuberculosis, the curable stage of which is "now or never." Possibly the wiser and safer course for the medical attendant is to consider all such cases as tuberculous; he will more often be right than wrong. In the interests of the patient, however, he will be culpably wrong if he brands a non-tuberculous person with the stigma of tuberculosis, with all the mental and

social distress which is inseparable therefrom. Dr. de Havilland Hall has done well to call attention to non-tuberculous hæmoptysis. At the present time the profession is in danger of being obsessed with the idea that all hæmoptysis without obvious cause is tuberculous in origin. When, as time goes on, no further symptoms of tuberculosis arise we deceive ourselves still further by concluding that our treatment has effected an arrest, or even a cure, of something which has only existed in our own imagination.—I am, Sir, yours faithfully,

Sheffield, August 15th, 1915. ARTHUR J. HALL.

THE RIGHT-SIDED MURMURS OF MITRAL STENOSIS.

To the Editor of THE LANCET.

SIR,—Cardiac phenomena described by Sir James Goodhart in your issue of July 3rd, and commented on later by Dr. A. Morison, are not difficult of explanation upon the hypothesis of default in the aspiratory function, an aspect of cardiac pathology which was treated by me in an article appearing in THE LANCET in May last year. Under normal conditions the heart and its tributary veins lie in a minus pressure environment. Here, under cover of the thoracic wall, the column of venous blood extending from the diaphragm to the right ventricle is protected from the weight of atmospheric pressure, while the tail of the column occupying portal and systemic veins lies exposed to it. In obedience to the law of least resistance the current of the venous stream sets from periphery to centre and the right auricle during diastole and its tributary veins distend before the rising column, to the full measure of their capacity. When intrathoracic minus pressure is low atmospheric pressure loses its driving force and the venous column fails to distend the right auricle. Failure in auricular diastole determines failure in auricular systole. So in the absence of intrathoracic minus pressure the stream in venæ cavæ languishes, auricular function falls into abeyance, and congestion occurs in portal and systemic venous circulation.

Pulmonary circulation suffers also in efficiency. The tail of the systemic venous column lies in splanchnic and systemic capillaries, but the tail of the pulmonary venous column ends in pulmonary capillaries. It is here that the driving force of atmospheric pressure exercises itself, but in the absence of intrathoracic minus pressure *vis a tergo* in the pulmonary stream ceases to be operative and the left auricle remains in a depleted, contracted, and functionless state. Stasis in the pulmonary stream favours congestion of pulmonary capillaries and, as a natural sequence, engorgement of right ventricle. A low degree of intrathoracic minus pressure is attended by the following conditions—namely, engorgement of right ventricle, congestion of pulmonary capillaries, depletion of left auricle and tributary veins, engorgement of portal and systemic venous circulation and depletion of right auricle and tributary veins. But depletion of the auricles is attended by constriction of their walls and abeyance of their functions, a condition not unfavourable to the disappearance of the "a" wave from the jugular curve and the production of murmurs resembling those of auriculo-ventricular stenosis.

A frequent cause of the reduction of intrathoracic minus pressure is intragastric and intra-abdominal hyper-pressure. In conditions of physical fitness a state of intra-abdominal minus pressure prevails and the plane maintained by the aponeurosis of the diaphragm is low. In a direct ratio with the loss of intra-abdominal minus pressure and its conversion into a plus figure the aponeurosis rises, intrathoracic minus pressure falls, and dextral cardiac trouble begins to declare itself. Its first sign is inability to run without breathlessness. This symptom is noticed to occur after eating—that is, at a time when intragastric pressure is high. The phenomenon is common enough even in young persons. Dyspnœa comes on soon after they begin to run, but ceases to trouble them when they continue running. Relief is attributed to "second wind," but in reality it results from escape of gas through the pyloric orifice and consequent reduction of intra-gastric pressure.

The origin of dextral cardiac disease and the pathology of its later manifestations are chiefly referable to default in the aspiratory function.

I am, Sir, yours faithfully,

H. WALTER VERDON.

Streatham Hill, S.W., August 15th, 1915.

MECHANICAL FACTORS IN THE EYEBALL.

To the Editor of THE LANCET.

SIR,—Is there not something to be learnt of the formation of the aqueous, from the low-tensioned flaccid state of the eyeball after death? Is it not entirely due to the absence of normal distension of the vascular coats of the eye by the blood pressure in life? This distension would cause a partial vacuum in the eye, especially so at the circumference of the cup. In other words, were it possible to still retain this pressure and make numerous radial sections of the globe the parts would expand like the petals of a bursting Composite flower. Such mechanical principles play a part in the formation of spaces in the embryo—e.g., the pleural space. This theory would account for the maintenance of the aqueous, apart from the secretion theory, and corresponds in principle somewhat to Bier's suction treatment. Of course, where the coats are over-distended the conditions are changed, the contents becoming compressed.

I am, Sir, yours faithfully,

HORATIO MATTHEWS, M.D. Glasg.

Eastbourne, August 9th, 1915.

DISEASED TONSILS IN RELATION TO RHEUMATISM.

To the Editor of THE LANCET.

SIR,—Dr. C. W. Chapman, whose letter appears in your issue of August 14th, is, in my opinion, probably correct in regarding "tonsillitis as both primarily rheumatic and provocative of further attacks of rheumatism if the tonsillar inflammation becomes chronic." Rheumatism assumes many forms. One patient may have inflamed muscles or joints, another may have endocarditis, another inflammation of the pericardium, the heart and its fibro-serous sac being only another form of ball-and-socket joint. Other rheumatics, again, have iritis, though rarely, and in some nodules appear on the bones of the forearm or on the scapulæ. Chorea in childhood I have long regarded as a rheumatic manifestation, and is complicated by heart disease quite as frequently as are other forms of rheumatism. Lastly, I was taught, and I taught for some years,

that tonsillitis was frequently a rheumatic affection. Here I am not so sure of my ground, and it now seems to me, with wider experience, that a diseased tonsil may probably be the port of entry of the specific organism which causes rheumatism. Be this as it may, the interesting clinical fact is that quite 75 per cent. of young patients who are the victims of acute rheumatism also suffer from diseased tonsils. I well remember pointing this out to a distinguished continental physician who attended my post-graduate class. He was sceptical on this point, but on his return home he wrote to me to say that his own statistics bore out my contention, and showed an even heavier percentage (80).

If this discussion will have the effect of hastening the discovery of a specific curative treatment for acute rheumatism or, better still, the prevention of the disease it will have helped to achieve a great boon. For I hold that rheumatism is the most dangerous disease which we have to deal with in this country—a disease more deadly and far-reaching in its effects than are syphilis, tuberculosis, or cancer.

If I may diverge from the line of discussion, I would point out that rheumatism affecting young children or adolescents leaves mitral stenosis as its most frequent and crippling valvular affection. Or if I put it in another way, mitral stenotics who live to adult age will be found, when carefully interrogated, to have had rheumatism in one or other form during the early years of their lives.

I am, Sir, yours faithfully,

Seymour-street, W., August 16th, 1915. SEYMOUR TAYLOR.

ACUTE POST-OPERATIVE CAPILLARY BRONCHITIS.

To the Editor of THE LANCET.

SIR,—I should be glad to hear if any of your readers have encountered cases like the two following.

1. In September, 1914, I operated on a man aged 25, enucleating the tonsils. They were fibroid and not easy to remove, the operation lasting 25 minutes. The anæsthetic given was, for the first few minutes, ether and chloroform in equal parts; for the remainder of the operation pure chloroform was used at my request, because there was a good deal of oozing. At the conclusion, when I was swabbing out the mouth with dry swabs, a large amount of froth suddenly began to well up. In colour this was brick-red, exactly like a mixture of clean blood and hydrogen peroxide. In amount it was so profuse that, except for the sake of keeping the air-way clear, there was no necessity to assist in the expulsion of the froth by swabbing, for as the patient lay on his side it poured out in a steady stream. As the bleeding gradually ceased the froth became colourless. He became and remained cyanosed, and his chest was everywhere full of moist râles. He was given oxygen, but there was no change in his alarming condition for six hours. At the end of this time the cyanosis, flow of froth, and signs in the chest disappeared as suddenly as they had occurred.

2. Two weeks ago I was resecting the septum and removing a nasal spur from an adolescent male. Anæsthesia was induced with ether, and after that only pure chloroform was used. At the end of the operation, half an hour later, the patient behaved in a way identical with the former case. In no detail was there any difference, except that as treatment the second patient was given atropine sulph. hypod. gr. 1/100, and not oxygen, and that the sudden cessation of the condition occurred after only one hour. In neither case was any hydrogen peroxide used.

Each of the above patients had healthy lungs and heart and was in the hands of a competent anæsthetist. Each of them had been given the usual preliminary injection of atropine. Neither of them was given more than a small amount of ether, and that only at the beginning; whereas the bronchitis supervened in each case about half an hour later, when the anæsthetic had been stopped. The condition presented by these two patients differed from ether pneumonia in that the former was of immediate onset and short duration, and seemingly only a bronchitis.

I am, Sir, yours faithfully,

H. LAWSON WHALE.

Harley-street, W., August 16th, 1915.

"TRANSIENT RENAL CONGESTION."

To the Editor of THE LANCET.

SIR,—It seems hardly necessary to cumber our nomenclature with a new name for the four cases related by Dr. C. W. J. Brasher under the above heading in THE LANCET of August 14th, when they might be described as "acute nephritis," or more probably as "paroxysmal hæmoglobinuria." Certainly the description tallies with all the published cases of the latter disease—caused by "chill and fatigue"—the deep-coloured urine passed, and the transitory nature of the attack, and in one case the recurrence, when exposed to fatigue and cold. While in Case 4 the "cocoa-like deposit in the urine" bears some resemblance to hæmoglobinuric urine, though in this case "treatment and confinement to bed for two and a half years" should have done a good deal to cure the condition. There is, of course, much information missing—e.g., one would like to know the condition of the blood and serum, also as to the presence in the serum of free hæmoglobin—and there are several points on which one would like information as to the paroxysm itself, and the urine passed immediately afterwards.

In conclusion, I would venture to suggest that some of the cases of renal disease coming from Flanders are due not only to "wet and cold," but to the poisonous fumes from high explosives, as phosphuretted hydrogen, naphthol, benzol, toluenediamine, carbon monoxide, and many other poisons are known to cause hæmoglobinuria, which may be the starting-point of nephritis, in any of its protean forms.—I am, Sir, yours faithfully,

A. CHARPENTIER, M.D. Durh., D.P.H. Lond.

Uxbridge, August 15th, 1915.

INDIAN DOCTORS AND VACANT APPOINTMENTS.

To the Editor of THE LANCET.

SIR,—I am glad that at a meeting convened by the British Hospitals Association at Charing Cross Hospital on July 30th, and reported in your journal on August 7th, Sir William Collins called attention to the claims of Indian medical men to a share in filling medical appointments in this country. Seeing that the Indians are just now proving their mettle in the battlefield and fighting side by side with the British, it is time the old prejudice against them, like many other

fallacies which the war has exposed, should be adjusted and modified according to present conditions and needs. Only two or three weeks ago the appointment of an Indian to the post of house surgeon somewhere in Cornwall was cancelled at the very last moment, after it had been duly made, because of his nationality. A single case like this would do more harm now to the national cause in India than a thousand Indian sedition-mongers. My long experience enables me to say that Indian doctors in their various appointments, after the first feeling of strangeness caused by the difference of colour is over, not only give satisfaction to their authorities, but endear themselves by their gentleness and abstemious qualities. One can quite understand, and even justify, the preferment of an Englishman when he is competing for a post with an equally able and efficient Indian candidate, but one feels prejudice has triumphed over justice when an Indian is rejected even though he is proved superior in talents and ability to his English rival. Especially now, when all the world is praising the bravery of the Indian troops, their wonderful patriotism in rallying round the British flag, their devotion in giving freely their lives and treasure, the least the hospital authorities and governors can do is to give the Indian an opportunity to compete on equal terms with others (he asks for no favour), without prejudicing his candidature because of his colour or nationality.

I am, Sir, yours faithfully,

Wells, Somerset, August 16th, 1915. C. MUTHU.

THE THERAPEUTIC USES OF TURPENTINE.

To the Editor of THE LANCET.

SIR,—The article by Major G. Grey Turner, published in THE LANCET of July 31st, on the Value of Turpentine as a Hæmostatic, recalls to my memory Billroth's "Lectures on Surgical Pathology and Therapeutics," published by the New Sydenham Society, 1877, and on pp. 50 and 51 of Vol. I. will be found a striking reference to the utility of turpentine for the arrest of bleeding during an operation. I well remember its successful employment in the operating theatre of the Bedford Infirmary (now known as the Bedford County Hospital) in the late "seventies."

I am, Sir, yours faithfully,

ROWLAND H. COOMBS, M.D. Durh.,
Senior Physician, Bedford County Hospital.

Bedford, August 10th, 1915.

A NEW ANTISEPTIC.

To the Editor of THE LANCET.

SIR,—With reference to the annotation with this title in your issue of August 14th, I would remind you of an article written by me and published in THE LANCET of Jan. 18th, 1908, entitled, "Electrolytically Produced Fluids containing Hypochlorites, their Manufacture, and the Rationale and Chemistry of the Process for Securing Stability." As you are aware, for the past ten years I have been making in Poplar a solution of hypochlorite of magnesia and rendering it stable, and for reasons given in my article referred to above I consider it the best of all the hypochlorites, as it is readily rendered neutral by my process and is not caustic. Installations can be easily erected where there is electrical power near the sea border, and any quantity of this electrolytic fluid made and rendered stable, and perhaps the free douching of wounds in their various stages with this electrolytically made fluid would benefit our disabled soldiers and those of our Allies. There are seven depôts in Poplar for the purposes of distributing this fluid among the inhabitants, the purification of swimming-bath water, putting in the baths of verminous persons, sprinkling floors of schools, &c.

In Poplar, of course, artificial sea water has to be made by means of salt and chloride of magnesia. If plants were installed near the sea border, where there is electrical power, an ample supply of this disinfectant could be furnished at a nominal cost, if not for the douching of wounds, certainly for the disinfecting of wards and floors and various sanitary arrangements and offensive heaps.

I am, Sir, yours faithfully,

August 14th, 1915. FREDK. W. ALEXANDER,
Medical Officer of Health for Poplar.

Obituary.

SIR PETER EADE, M.D. LOND., F.R.C.P. LOND.,

HONORARY FELLOW OF KING'S COLLEGE, LONDON; CONSULTING PHYSICIAN, NORFOLK AND NORWICH HOSPITAL, NORWICH DISPENSARY, AND JENNY LIND INFIRMARY FOR SICK CHILDREN.

WE regret to record the death of Sir Peter Eade, one of the best-known provincial physicians in the country and a distinguished citizen of Norwich, who died at his house in St. Giles's, Norwich, early on Thursday morning, August 12th. Considering his great age he had remarkable vitality, but had been in failing health for some months, and the end was not unexpected.

Sir Peter Eade, who was born at Acle, Norfolk, in 1825, came of an old Suffolk family with records in Saxmundham and Carlton. He was the grandson of the Rev. Peter Eade, of Cotton and Stow Bedon, and the son of Dr. Peter Eade, of Blofield, near Norwich. He was educated at Yarmouth Grammar School and first studied medicine upon the old apprenticeship system under his father at Blofield. Later he served as a pupil at the Norfolk and Norwich Hospital under the famous Norwich lithotomist, Mr. John Greene Crosse, F.R.S. He then entered King's College, London, where he had a brilliant career, carrying off the University medical scholarship and more than one gold medal. He qualified as M.R.C.S. and L.S.A. in 1847, and in the same year took his degree of M.B. Lond., proceeding to M.D. in 1850. For a time he practised with his father at Blofield, but in 1856 he came to reside in Norwich, where he early made his mark as a skilful and learned physician. He was elected physician to the Norfolk and Norwich Hospital, became F.R.C.P. Lond. in 1873, and held the position at the hospital until 1888, when he retired and was appointed consulting physician. He was, moreover, consulting physician to the Norwich Public Dispensary and the Jenny Lind Infirmary for Sick Children, and the Children's Convalescent Home at Yarmouth in connexion with this infirmary, which was established in 1883, also benefited from his skill and attention. He had a great reputation not only in Norwich but throughout the Eastern Counties, and his advice was much sought and highly valued. He was the author of Notes on Influenza and Notes on Diphtheria. His essays on the Treatment of Boils and Carbuncles and on the Local Use of Cold in Abdominal Inflammations were published in THE LANCET;

and he wrote also on Some Modern Medical Aspects of Life Assurance and on Diabetes Insipidus. All Eade's medical writings bore the same stamp; they were the records of his great and varied practical experience, detailed with the sole object of helping his brother practitioners to treat the sick.

In the civic life of the old cathedral city of Norwich he played a conspicuous part for half a century. He began his public work in Norwich by serving on the board of guardians in 1863, and became a member of the town council in 1869, a magistrate in 1871, and sheriff of the city in 1880–81. He was three times mayor of the city, in 1883–84, 1893–94, and part of 1895, when he completed the year of Colonel Bignold, who died in office. In his first mayoralty the famous Norwich Castle, so long a prison, was transferred by the British Government to the city, and it has since become a fine museum with a notable collection of pictures of the Norwich School. In 1895 Sir Peter Eade was presented at the Castle Museum with a silver-gilt casket containing a scroll bestowing on him the honorary freedom of the city and also with his portrait subscribed for by many prominent citizens and others, which now hangs in the picture gallery. In his public capacity he was an admirable and open-handed host. He entertained Royalty on more than one occasion, and gave dinners to various assemblies in the famous old St. Andrew's Hall. He took a great interest in promoting open spaces for Norwich, and started the movement which resulted in the laying out of Chapel Field Gardens and the developing of Mousehold Heath (known locally as "Mussel") as a park for the people. He also made efforts to acquire the Wingfield Estate in St. Augustine's from the trustees, but no satisfactory agreement was brought about before the place was largely built upon. He was a director of the Norwich Union Life Assurance Society and a trustee of the Norwich Savings Bank, and prominent in every public scheme for the promotion of temperance, sanitation, and the welfare of his poorer neighbours. He took a deep interest in the parish where he so long resided and where he spent his last days in his garden; and in 1886 he published an account of St. Giles's, Norwich, which is full of interesting historical matter. It goes without saying that he was a student and fervent admirer of the famous Norwich physician and writer, Sir Thomas Browne, and he took a prominent part in the movement which resulted in the erection of a statue in the city to the author of "Urn Burial."

Sir Peter Eade, who was knighted for his valuable public services in 1885, after his first mayoralty, married in 1872 Mrs. Ling, a widow, the daughter of Mr. Hugh Rump, of Wells.

THE late Dr. Marcus John Eustace, who died at Widnes on August 6th, had an interesting and varied career. After graduating at Dublin University in 1889 he started practice in Hampshire, and later went to Persia in connexion with the medical branch of the Church Missionary Society. Here he became surgeon to the Port Medical Authority and also to the British Consulate. Owing to ill-health he returned to England for a short period and afterwards went to Africa, subsequently taking part in the Boer War, receiving the medal and four clasps. Invalided home, he started work at the Widnes Foundry as a labourer, believing that physical exercise would be the best treatment for his illness. His identity was established by the skilful manner in which he treated an accident at the works and he then resumed his professional career and enjoyed great popularity at Widnes.

The War.

THE CASUALTY LIST.

THE following names of medical men appear among the casualties since our last issue:—

Killed: Captain A. Kellas, M.B., Ch.B., D.P.H., R.A.M.C. (T.F.), 1st Highland Field Ambulance, attached to the 29th Division, senior medical assistant to the Royal Asylum, Aberdeen.

Died: Lieutenant-Colonel G. A. Edsell, M.D., R.A.M.C. (T.F.), commanding officer of the 1/3 Home Counties Field Ambulance, who was at the front for several months, where he contracted pleurisy and was invalided home, died at his residence at Surbiton on Sunday night.

Wounded: Lieutenant M. J. Cronin; Lieutenant C. M. Harris, attached to the 7th Royal Scots Fusiliers; Lieutenant E. W. Adcock, attached to the 6th Yorkshire Regiment; Major D. S. Skelton; Lieutenant A. J. O. Wigmore, M.B., attached to the 5th Wiltshire Regiment; Lieutenant C. R. Dudgeon; and Lieutenant R. P. Nash, attached to the 1st Lincoln Regiment—all of the R.A.M.C.

THE HONOURS LIST.

The Distinguished Service Order has been conferred upon the following medical officers for naval services at the Dardanelles:—

Surgeon Peter Burrows Kelly, R.N.

Was wounded in the foot on the morning of April 25th, in the *River Clyde*. He remained in the *River Clyde* until the morning of April 27th, during which time he attended 750 wounded men, although in great pain and unable to walk during the last 24 hours.

Surgeon Martyn Henry Langford, R.N.

During the time H.M.S. *Inflexible* was steaming to Tenedos, after having struck a mine, Surgeon Langford brought up the wounded from the fore distributing station in the dark. Fumes permeated the place, rendering five men unconscious. Though partially overcome by the fumes he continued his work.

Fleet-Surgeon Edward Henry Meaden, R.N., and Surgeon John Harding Baynes Martin, R.N., are "commended for service in action."

MENTIONED IN DESPATCHES.

The following officers connected with the medical profession are mentioned in a despatch from Vice-Admiral J. M. de Robeck, dated July 1st, reporting the landing of the army in the Gallipoli Peninsula, April 25th–26th: Surgeon P. B. Kelly, R.N., attached to the R.N.A.S., who is "specially recommended"; and temporary Surgeon W. D. Galloway, H.M.S. *Cornwallis*, who is "commended for service in action."

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men are to be added to our lists of those who have fallen during the war: Captain J. C. Morgan, 6th Yorkshire Regiment, only son of Mr. John H. Morgan, C.V.O., F.R.C.S., consulting surgeon to Charing Cross Hospital; Second Lieutenant H. T. Payne, Essex Regiment, second son of Mr. F. C. Payne, M.R.C.S., L.R.C.P., of Witham, Essex.

THE TREATMENT OF INJURIES IN WAR.[1]

A small book on the "Treatment of Injuries in War Based on Experience of the Present Campaign" has just been issued through Messrs. Harrison and Sons, and will be in the hands of all the medical officers engaged with the Expeditionary Force immediately. It is an extraordinarily complete little book, containing in its 130 pages a vast mass of teaching. If nothing that appears in it is very new, it is none the less valuable as confirming in an unmistakable way the recognised principles of antiseptic surgery. A brief preface by Sir Arthur Sloggett, Director-General of the Army Medical Service, defines the scope of the book, which has been drawn up with a view to summarise the experience gained at the various military hospitals in France during the past ten months and to attain some common lines of treatment according to methods based upon definite observation. In no other way can any uniformity be obtained and a general guide produced that will be of practical service in the ordinary circumstances of war.

The Director-General confesses that any attempt to cover the whole field of military medicine and surgery would obviously be impracticable, so that the memorandum is confined to considering the various indications for practical procedure in certain classes of cases. The recommendations being the outcome of the conditions under which the work with the Expeditionary Force has actually been done, take note of any special features of injury in war which are dependent on climatic conditions, environment, or military procedure. The treatment on the spot, the primary transport from the field of battle, and the later transference of patients to this country are the conditions which it has been designed to meet.

At the Clearing Stations.

Sir Arthur Sloggett points out that the conditions of this campaign have resulted in the surgical treatment of patients being divided into more or less distinct stages: (1) That at the field ambulances and casualty clearing stations; (2) that at the various medical bases in France; (3) that at the actual medical base in this country. The handbook begins at the natural beginning of the subject by discussing the treatment of wounds at field ambulances and casualty clearing stations. It is noted that the general result of gunshot wound is not to cause serious injury or material shock, but none the less in every convoy of wounded there will be collapsed men, and the treatment of these is carefully explained. The importance of removing the first field dressing at the field ambulance is insisted upon. Here also hæmorrhage should be arrested if possible, and the preferable method of cleansing the wound is described. An important caution is given that if bleeding has been arrested by plugging the wound a special note of this should be sent with the patient for the information of the medical officer to whose care he is consigned, while the value of drainage is emphasised in the following clear terms: "Observation of a very large number of cases has shown that the provision of adequate drainage suffices to prevent any serious general or local extension of infection which has already occurred, and in conjunction with the mechanical methods of cleansing forms the essential element in the primary treatment of gunshot wounds." No one will be surprised to hear that experience has been disappointing as to the efficacy of any antiseptic medium to inhibit bacterial growth within the many fouled wounds produced by shrapnel and often by rifle, but antiseptic preparations are recommended as invariably to be used in the primary treatment of wounds. The antiseptics recommended are a 2 per cent. solution of iodine in spirit, solutions of carbolic acid of varying strength, lysol, and biniodide or perchloride of mercury, and, as a preliminary, hydrogen peroxide solution. A few considerations in the employment of the different antiseptics are mentioned, and the value of immobilisation of wounded limbs is indicated.

At the Base Hospitals.

The arrival of the patient at the base hospital will allow of wider variation of methods, and it is laid down as a general rule that at this period of treatment application of powerful antiseptic media to the wound is undesirable, while the principles advocated by Sir Almroth Wright and supported by a large consensus of opinion on the part of competent observers are adopted. The method of wound treatment propounded by Sir Almroth Wright is, it will be remembered, the promotion of a free outflow of lymph favourable to phagocytic activity and inimical to microbes from the tissues into the wound. This "lymph lavage" is encouraged by the application of hypertonic solutions of sodium chloride. A memorandum on the treatment of bacterial infections of projectile wounds issued to all medical units in April, 1915, gave the following instructions which are quoted.

> For ordinary use the best application will be a 5 per cent. solution of common salt combined with ½ per cent. citrate of soda to render the lymph incoagulable. Where citrate of soda, or a similar decalcifiant, is not available a simple 5 per cent. solution of salt will serve. In dealing with dry and infiltrated wound surfaces stronger solutions of salt (up to 10 per cent.) will be found to resolve the induration and to clean up the wound surfaces much more quickly than weaker solutions.
>
> The hypertonic solution or "drawing agent" has done its work as soon as it has checked the spreading invasion of the tissues or has cleaned up the dry and indurated wound surface, and this last has clothed itself in bright coral-red granulations. The hypertonic salt solution may then be replaced by some simple dressing.

The combination of a hypertonic solution and an antiseptic is recommended, the uses and limitations of hydrogen peroxide are pointed out, with the timely reminder that a change of application often gives good results. The good wrought in some cases by continuous baths, continuous irrigation, and exposure to the air and sun is allowed.

The other main things in the subsequent treatment of wounds on which stress is laid are the necessity of making incisions to relieve tension, especially where there is anaerobic infection, the avoidance of pain during the changes of dressings, and the general indications with regard to the removal of foreign bodies.

Gas Gangrene and Gaseous Cellulitis.

The subjects of gas gangrene and gaseous cellulitis, of tetanus, and of hæmorrhage, recurrent and secondary, are then considered. Gas gangrene and gaseous cellulitis have formed the most serious complication of wounds in certain parts of the fighting area, and are due to anaerobic organisms derived from dung. The favouring conditions are summarised, the course of the disease

[1] Memorandum on the Treatment of Injuries in War Based on Experience of the Present Campaign. London: Harrison and Sons. 1915. Pp. 130.

and its mode of onset are described, and the treatment recommended is directed towards neutralising precedent conditions, the general indications being the removal of as much blood clot and devitalised tissue as possible, and provision of free access to the air with efficient drainage. We quote the categorical instructions:—

Any wound that shows local signs of gaseous cellulitis should be freely opened under an anæsthetic, dead skin or muscle should be cut away, and the whole wound should be most thoroughly cleansed by mopping it out with gauze and an antiseptic till every part of it is completely cleaned. Hydrogen peroxide is specially advised by many surgeons, and may be used in conjunction with other antiseptics. Suitable drainage-tubes should be inserted, and the wound either dressed with some form of moist compress or left exposed to the constant application of hypertonic salt solution. If the neighbouring cellular tissue is gaseous and crackling it must be incised and treated like the wound. If the hand or foot is warm and sensitive amputation should not as a rule be performed.

Tetanus.

The heavily manured soil of the districts in which much of the fighting has occurred has frequently contained the spores of tetanus bacilli, and the memorandum points out that all the general measures already described for the cleaning, dressing, and drainage of freshly received wounds, as well as for their appropriate surgical treatment with a view to avoiding the risks of sepsis, will minimise the risk of tetanus; but the prophylactic use of tetanus antitoxin is now general and the results of this preventive inoculation have been admirable. The preventive dose of 500 units, says the memorandum, should be given subcutaneously at a distance from the wound at the earliest possible moment, the fact of inoculation and the size of the dose being recorded on the tally. If preventive treatment fails and the disease is established local and surgical measures have to be taken, and the various treatments adopted are stated in the memorandum. Careful study of 179 cases, with a mortality of 78 per cent., showed that the tetanic symptoms had completely subsided under treatment in the majority of the cases, septicæmia, gangrene, or secondary hæmorrhage accounting for the fatal issue. The local measures are the opening up and cleaning of the wound, the swabbing with pure carbolic acid, and occasionally amputation of the limb. The general measures are to avoid all external stimuli likely to start spasm by keeping the patient in a quiet, darkened room, with an equable temperature, and sometimes the use of sedatives and anæsthetics. If these do not appear, however, to modify the course of the disease it must be remembered that large doses may do harm. The inoculation of carbolic acid subcutaneously is mentioned, but the results are said to be disappointing. The use of magnesium sulphate in the same way has not proved reliable. Tetanus antitoxin is the only treatment as to the value of which there has been anything like general agreement.

The Range of Contents.

This brief analysis of the first sections of the memorandum shows the care and particularity exercised in its writing, and, in effect, the whole of the surgery at the war is handled with the same thoroughness. The treatment of different fractures, of wounds of joints and of head, spinal injuries, penetrating wounds of the chest and abdomen, and injuries to the ear and eye are all considered in the same practical manner, general principles being laid down, explaining now the object to be attained by an operation, now the details of the operative technique itself, and now the symptoms of the injury, with possibly the points of diagnosis between the real and functional condition. The indications for abdominal operations seem to us particularly sound and form a valuable consensus of opinion.

An Authoritative Document.

The memorandum supplies to the medical men serving with the forces that central direction which is all the more needed because peripheral efforts have in so many circumstances to be individual. In civil hospitals from a careful study of the conditions within their sphere a line of treatment has been arrived at—not a hard-and-fast line, but a line of common consent, along which men can work supported by authority. By this memorandum in the same way the mark of authority is supplied in carefully thought out directions for diagnosis and treatment, based upon actual experience of a year of war, and collated by medical officers of the highest scientific standing. It is certain that some of the directions must have been arrived at by a process of compromise, and thus play is left for individual intelligence.

War Emergency Committee and Medical Officers for the Army.

The War Emergency Committee is taking steps to impress on every medical practitioner not at present on whole-time naval or military service the immense military effort in which this country is engaged, and the necessity of a further and immediate response from the medical profession. A deputation of the Committee met Sir Alfred Keogh, Director-General of the Army Medical Service at the War Office, on August 4th, and received from him such information as left no doubt as to the vital and immediate necessity for more medical officers of military age—namely, 40 years and under. Sir Alfred Keogh has authorised the Committee to act as his agent in securing this further response from the profession, and the following letter has been issued to every practitioner in England and Wales who is not on whole-time active service, signed by Mr. T. Jenner Verrall, the chairman of the Committee, and Mr. N. Bishop Harman and Dr. Alfred Cox, the secretaries:—

Without medical officers fighting units cannot be properly constituted. They are necessary to keep the soldier fit, to supervise his physical activities in drill and march, to watch food and water, to secure a sanitary camp, and, above all, to act as an educational influence to the men from the physical and sanitary point of view. If a medical man is to carry out such duties successfully he must have some military training. Professional training alone is not sufficient. The officers are therefore required at once, so that they may be trained for the calls which will be made upon them in the early future both for the above-mentioned services and for the treatment of the sick and wounded.

This appeal is addressed to you personally. The Committee knows how difficult it is for most medical men to arrange to leave their work, but the same thing applies to a greater or less extent to nearly every man who is serving his country. If you are of military age we ask for your personal service as a naval or military medical officer. If you are over age we ask you to encourage the enlistment of the younger men by so coöperating with your neighbours as to set free the men who are willing to go if arrangements can be made. The elder man who helps to release the younger men is doing his part just as much as he who serves abroad.

Already in most areas special committees have been set up representative of the whole medical profession, in order to make arrangements for setting practitioners free for naval or military service, and this Committee is urging those areas which have not constituted local committees to do so at once.

You will no doubt be approached shortly by the secretary of your local committee, but in the meantime we urge you to act at once, and to communicate with us so that we may help you in making such arrangements as are necessary.

It is realised that the responsibilities for carrying on your work must rest primarily with your neighbours, but we invite you to look to this Committee for any advice or assistance that can be given centrally, and the Committee, acting in coöperation with the local committee, will by every means in its power try to protect the interests of practitioners who respond to the call of their country.

Finally, we ask you to believe, on the strength of confidential information which has been given to this Committee, that the need for medical officers of military age is extremely urgent, and the Committee has no doubt that it is the duty of every medical man of military age who can by any possibility offer himself for service to do so.

The following letter from Sir Alfred Keogh, the Director-General, Army Medical Service, to the secretaries of the War Emergency Committee, dated August 9th, has also been circulated by the Committee:—

DEAR SIRS,—As I explained at my interview with members of the War Emergency Committee on the 4th instant, I cordially welcome the establishment of the new Committee on its extended basis, representing as it does all sections of the medical profession, and I hope to receive from it much help in my work of providing officers for the Royal Army Medical Corps.

In order that there may be no doubt as to the close relationship which I hope will exist between your Committee and this department, I have pleasure in stating that I recognise in it an excellent medium for dealing with the great problem which now faces the profession—namely, how to supply medical officers for the Forces and at the same time to protect the needs of the civil population as far as possible, and I gladly authorise the Committee to make appeals to the profession with the object of securing these ends.

After my conversation with your deputation I need only emphasise the importance of prompt and increasing supplies of medical officers by saying that in my opinion you cannot put the claims of the Medical Department of the War Office too strongly. I am, yours faithfully,

(Signed) ALFRED KEOGH, D.G., A.M.S.

The Secretaries, War Emergency Committee,
Offices of the British Medical Association,
429, Strand, W.C.

The War Emergency Committee point out that offers for whole-time service may be divided into two classes: 1. Men under 40, whose services will be accepted for a period of 12 months, and who will be liable for service at home or abroad. 2. Men over 40, who may offer their services for a period of 6 or 12 months. These will not in present circumstances be sent to the front, but will be employed in this country (if they have joined for 6 months only) or at home or in such stations as Egypt, Malta, and Gibraltar (if they have joined for 12 months). If they desire it, and have been found serviceable, they may be re-engaged at the end of 6 months. Men not much over 40 of good physique should, however, offer for general service, as they may be required to do duty with the Expeditionary Force later.

Men may enrol their names with the War Emergency Committee, declaring their readiness to join after a certain date on receiving 36 hours' notice from the War Office that their services are forthwith required. If they engage on a 12 months' contract they will receive temporary commissions in the Royal Army Medical Corps, with an allowance of £30 for outfit, and pay at the rate of 24*s.* a day, with 1*s.* 9*d.* for ration allowance, and a gratuity of £60 at the termination of the engagement, subject to satisfactory service. If the engagement is for 6 months the terms are the same as for the longer period, but the gratuity would be £15 instead of £60.

SCOTTISH MEDICAL SERVICE EMERGENCY COMMITTEE.

It has been brought to the notice of the Scottish Medical Service Emergency Committee that statements are in circulation which might have seriously interfered with the success of the effort to provide the necessary medical men for the army. The convener, Dr. Norman Walker, at the request of the Committee, accordingly wrote to the Assistant Director-General of the Army Medical Service detailing the statements which were being made and asking for a reply which could be used to controvert them.

Briefly, the statements were that the needs of the army in regard to medical officers were exaggerated, that the War Office had already as many medical men as were required, and that men had offered their services only to have them declined.

To this letter the Director-General of the Army Medical Service directed a reply to be sent which may be summarised as follows:—

To outfit the new armies and to supply reinforcements for six months it is estimated that at least 2500 more medical men of military age (i.e., under 40) will be required.

Temporary commissions have been, during the last six months, granted in every case when the applicant was prepared to fulfil all the conditions of the contract for service. In some cases when the offer of service was accompanied by special conditions it was not possible to accept it. No official in the medical branch of the War Office has ever told anyone that no more medical men are required. Indeed, it has been found necessary to make special provision to bring as many medical men as can be got from Canada, Australia, and New Zealand. It is specially incumbent on every young doctor who is physically fit to offer himself for military service. All will be needed, and practically all of them will have an opportunity of serving with the troops overseas.

The duty of the older men is to set free the younger men by arranging to carry on their practices for them in their absence or by engaging for home service.

From the foregoing it is plain that any medical men preventing or dissuading their colleagues from assisting the army during the war is doing a serious disservice to the Empire, and such action can only be attributed to ignorance of the real needs or to lack of patriotism. We are glad that the Scottish Medical Service Emergency Committee treated the matter with the attention that it deserved, and by so doing obtained the help of the Director-General of the Army Medical Service to put a stop to the circulation of incorrect statements. For these same statements have been widely disseminated

THE SICK AND WOUNDED IN FRANCE: NOTICE FROM THE ARMY COUNCIL.

Owing to the British and French military requirements it has been necessary for some time to limit strictly the visits to France of relatives of sick and wounded officers and men. The Army Council wish the relatives of all ranks to understand that this limitation is one of the necessities of the military situation, and feel sure that they will readily accept it on this understanding.

In cases where permission to visit is given the regulations have been much simplified and are as follows:—

1. In cases where an officer or soldier is in a dangerous condition through wounds or sickness and there is no military or medical objection to a visit being paid to him, a telegram (or letter preceded by telegram) granting permission will be sent by the War Office or Military Record Office to the relative who may visit him.

2. No passport or permit will be required, but the relative, if desiring to make the visit, must carefully preserve the

telegram or letter granting permission, observe all the instructions given in it, and produce it before the Embarkation Commandant at the port named.

3. Only one relative can be allowed to visit each patient.

4. Free passage and accommodation can only be given to relatives of soldiers in a very limited number of cases, and only when the relative cannot afford to pay his or her expenses. When it is possible to grant such free passage and accommodation, relatives will be notified by the Record Office. In all other cases relatives must pay their own expenses, and are warned that accommodation will probably prove very limited and costly.

THE LOSS OF THE "ROYAL EDWARD."

The losses sustained by the "details" of the Royal Army Medical Corps, announced by the Admiralty to have been on board the *Royal Edward* when she was torpedoed in the Ægean Sea, have not yet been made public officially.

TIFO PETECCHIALE IN THE AUSTRIAN RANKS.—An Italian correspondent writes:—"'Tifo petecchiale' (the typhus petechialis of Italian classification), rare south of the Alps, is all too familiar in Germany, where it has been specially studied—by no one more effectively than Professor Prowazek, who, indeed, has fallen a victim to it in the course of his experiments. Within the last few weeks the Italian medical staff at the front have had their attention drawn first among the Austro-German prisoners, then among the personnel charged with the superintendence of the same, to cases on the sick list in which severe headache, general malaise, and pains in the arms and legs have been followed by intense rigors preluding high fever (temperature 40°–41° C.), ending in extreme prostration with profound somnolence. On the third or fourth day there appear on the skin, especially on the thorax and abdomen, a number of red spots varying in size from a pin's head to a pea—the petechiæ proper, which give the name to the disease. In the few cases of recovery, after two weeks (a shorter period than that in which abdominal typhus runs its course) the patient sweats profusely and convalescence is accompanied by fine desquamation. In the great majority of cases the disease has been incurred by indirect contact of the healthy with the infected subject or by direct exposure to the surroundings of the said subject, his clothes particularly, or by insect life, mainly pediculi, lodging in his linen. German experience, summed up by Prowazek shortly before his lamented decease, has found little efficacy in the usual treatment (quinine, salvarsan, and serum), and is now destroying the pediculi and their ova. The adult pediculus has least resisting power (as Prowazek found) to iodoform, to asafetida, and to frictions with sulphuric ether—an improvement on the mixture of 15 parts of oil of bergamot to 85 of alcohol, which was tried with some success in the late Balkan War. The ova, on the other hand, are most effectively destroyed by the sulphurisation referred to, and, where disinfectants are not available, by steeping the patient's clothes in a barrel charged with benzine. Further developments in the extermination of the pediculi, adult or in the egg stage, may be expected from the studies now prosecuted *ad hoc* by the medical staff under General Cadorna and at the hospitals in which the Austrian prisoners are under treatment for the disease—studies imperatively required by the menaced importation of a malady which has numbered many victims in the Austro-German army, and which through the constantly increasing relays of prisoners, from its Austrian contingents particularly, demands all the counteragents known to Italian sanitation and Italian medicine."

VACANCIES FOR MEDICAL OFFICERS.—We have been asked by Captain J. Horatio Baldwin, on behalf of the Commandant of the 1st (City of London) Sanitary Company, to intimate that there are vacancies for medical men with sanitary qualifications to take up commissions in this company. Captain Baldwin feels sure that there are medical men with the necessary equipment seeking to serve in the army who would be more useful in a sanitary company than if attached for purely surgical work, but it does not appear to be sufficiently known that there is such a unit as a sanitary company. Applications should be addressed to Captain Baldwin, Room B 6, the Duke of York's Headquarters, Chelsea, S.W.

GRADUATES OF QUEEN'S UNIVERSITY, BELFAST, AND THE WAR.—The news has just been received that Lieutenant E. M. Harper, 7th Battalion Munster Fusiliers, has been killed in action on August 9th at the Dardanelles. A Dungannon man, he had a most distinguished college and university career, being Andrews Scholar at Queen's College, Belfast, and an honours man when he graduated Bachelor of Science. At the beginning of the war he relinquished the post of demonstrator of chemistry in Queen's University to go to the front, and was appointed Lieutenant in the 7th Munsters. He was only 25 years of age. In last week's *Methodist Recorder* a chaplain at the front pays a splendid tribute to the work of Lieutenant W. McN. Chesney, M.B., R.A.M.C. (who graduated at Queen's University last year, and who has obtained the Military Cross), at the second battle of Ypres.

BRITISH AMBULANCE UNIT FOR ITALY.—The British ambulance unit for Italy, which expects to start in a short time for the fighting line, consists of 20 ambulances (of which 16 were given by the British Red Cross and 4 by the Society of Friends), 2 lorries, and 3 runabout cars. It has a personnel of 55. Mr. George Trevelyan, the historian of Garibaldi, is the appropriate commandant; Mr. Philip J. Baker, formerly commandant of the Friends' Ambulance Unit, is the adjutant; Mr. Allan Baker is section leader; Dr. G. Sandison Brock, physician to the British Embassy at Rome, consulting physician; and Dr. W. Radford Dakin consulting surgeon.

LAVAL UNIVERSITY, QUEBEC.—The War Office has accepted the offer of Laval University to maintain a stationary hospital of 520 beds in France, or wherever it is most needed.

WOUNDED SOLDIERS IN BELFAST.—On August 7th the hospital ship *Oxfordshire* arrived at the North Wall, Dublin, from Havre, with 611 wounded soldiers. Of these, 100 went to Cork, 50 to the Curragh, 141 to Belfast, while the remainder (320) were distributed among the Dublin hospitals. Of the Belfast contingent, 71 were sent to the Ulster Volunteer Force Military Hospitals (51 to the Exhibition Hall and 20 to Gilford); 20 to the Military Hospital at the Belfast Victoria Barracks; 10 to the Royal Victoria Hospital; 30 to the Mater Infirmorum Hospital; and 10 to Ballywalter Park, where Lord Dunleath has made full provision for their accommodation and treatment. The wounded men belong to regiments recruited from every part of the Kingdom, and their ages vary from 47 to 16 years.

NEW WAR HOSPITAL AT RAMSGATE.—A new hospital for wounded soldiers was opened at Ramsgate on August 14th by Lord George Hamilton. Viscount Chilston (county director of the Kent V.A.D.) presided, and was supported by Sir Cecil Hertslet, H.M. Consul-General for Belgium, the mayor and mayoress of Ramsgate, the mayor of Margate, and the chairman of the Broadstairs district council. Dr. J. H. Yolland, director of the Kent County Branch of the British Red Cross Society, said that the county of Kent had in 24 hours mobilised and equipped 74 hospitals on behalf of the War Office to receive the Belgian wounded arriving after the fighting at Antwerp. The new hospital is situated at Nether Court, and is composed partly of Nether Court House and partly of a new building, in which are the main ward, sanitary block, operating theatre, surgery, and offices. The two buildings are connected in several places by means of covered passages. The main ward is 120 feet in length, and adjoining are two side wards, each of 35 feet, the whole accommodating 50 beds. Other wards accommodate 32 beds, these being chiefly for the convalescents. The new building is timber-framed and lined on the outside with asbestos cement. The hospital is surrounded by extensive grounds, playing-fields, and gardens. There is a large conservatory recreation-room. The hospital has been modelled on the Cambridge Hospital. Owing to the generosity of the Ramsgate public it is practically free from debt, and only £100 are needed entirely to clear it.

BELGIAN HONOUR FOR AN ENGLISH MEDICAL OFFICER.—The *Moniteur Belge* announces from the Ministry of War of the Belgian Army that Major H. Stedman, R.A.M.C. (T.), of the British Army, who has directed and controlled the English Red Cross Ambulance installed at the

Sophie Berthelot School at Calais placed at the disposition of the wounded Belgians, has been appointed Chevalier of the Order of Leopold.

AN AMBULANCE TRAIN.—The Great Eastern Railway hospital train which was on view at Liverpool Street Station, as announced in THE LANCET of August 14th, was between August 5th and 16th inspected by over 50,000 people, and the receipts from inspection fees, with some extra contributions, amounted to over £1300.

THE subscriptions to the Edinburgh Red Cross Fund amounted last week to £679 17*s.* 2*d.* This sum included £256 15*s.* 2*d.* from the Margarets of Scotland for a motor ambulance.

AMONG the survivors of the auxiliary cruiser *India*, torpedoed in the North Sea on August 8th, we are glad to note the names of temporary Surgeon F. W. Lawson, R.N., and of Surgeon Probationer J. T. Johnston, R.N.V.R.

Medical News.

THE WELSH NATIONAL SCHOOL OF MEDICINE.—On August 12th Lord Pontypridd laid the foundation-stone of the new buildings of the Welsh National School of Medicine at Cardiff. It will be remembered that Sir William James Thomas has given over £90,000 towards the erection of the buildings on condition that Treasury grants are sufficient for maintenance. Previous to declaring the stone "well and truly laid" Lord Pontypridd paid a well-deserved tribute to Colonel E. M Bruce Vaughan, whose efforts on behalf of the school have resulted in contributions of over a quarter of a million. After the foundation ceremony a luncheon was held in the city hall, where a large and distinguished company assembled at the invitation of Sir William Thomas. In reply to the toast of his health, which was proposed by the Lord Mayor of Cardiff, Alderman J. T. Richards, Sir William Thomas declared his gratification at the presence of Sir William Osler, who would give counsel and wise advice in any future emergency. In expressing regret at the absence of those on military and other duties, he particularly referred to Sir Isambard Owen, who, he said, had done much by speech, by action, and by the inculcation of great ideals. Referring to his own share in the scheme for building the school, he said that he had provided the necessary building because he felt convinced that unless the several departments of a modern medical school were well housed and well equipped, men whose qualifications were sufficiently high to make the school a leading one would not be attracted. A thing that had largely influenced his decision was the suggestion that the offer of the provision of buildings for a complete up-to-date school would induce the Treasury to make an adequate grant for maintenance. This suggestion was founded on the speech by Mr. Lloyd George to a deputation, when he said he would advise His Majesty's Government to make a substantial contribution to the appeal that had been so earnestly placed before him. In conclusion, Sir William Thomas hoped that his example would be followed by others, not only in assisting in the completion of the medical school, but generally in the proper housing of the applied sciences and in the provision of new laboratories in chemistry, physics, and other departments of the school. If his action induced a wise and generous co-operation by the State the inauguration that day of a complete medical school for Wales would be for ever remembered as the proudest day of his life. Sir William Osler, who proposed the "Welsh National School of Medicine," referred to the work of the past, and paid a personal tribute to Professor Haycraft and Professor Hepburn. During the past 25 years there had been established at Cardiff what was the first and most essential element in a great medical school—namely, a great hospital. Now that they had in sight the completion of the physiological block, the library, and public health block, there was the difficult task of organising the relationship between the medical school and the hospital. This must be done on university lines. He commended the system of appointing the professors which was adopted at Oxford and Cambridge, the only two democratic universities in the world where a faculty of experts from all over the kingdom chose the best man. They must not start with the idea that they were going to have a local university with only Welsh brains; they must go out into the market and buy the best brains the country could supply. Professor E. H. Griffiths, who replied, assured Sir William Osler that the principals of the constituent bodies of the University desired that the medical school should be national in the true sense of the word.

WE much regret to learn that Dr. Alexander McEwen, of Crieff, was killed on the afternoon of August 12th, having been shot accidentally while shooting near St. Fillans, Perthshire. He succumbed to his injuries in a few minutes.

ON Wednesday last the freedom of the city of Peterborough was conferred on Dr. Thomas James Walker, on the occasion of his eightieth birthday. Dr. Walker, who has practised in Peterborough for over 50 years, has six of his nine sons holding commissions in H.M. forces.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

CHITTY, HUBERT, M.B., M.S. Lond. F.R.C.S. Eng., L.R.C.P. Lond., has been appointed Honorary Assistant Surgeon to the Bristol Royal Infirmary.

ENRIGHT, G. H., L.R.C.P. & S. Irel., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Sixmilebridge District of the county of Clare.

FAIRLIE, A., M.D. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Blyth District of the county of Northumberland.

GALBRAITH, S. NICOL, M.B., Ch.B. Glasg., D.P.H. Camb., has been appointed Medical Officer of Health and School Medical Officer for the Borough of Newark-on-Trent.

GRACE, ALFRED HENRY, L.S.A. Lond., has been appointed Deputy Acting Medical Officer of Health by the Chipping Sodbury (Gloucestershire) Rural District Council.

JONES, W. B., M.D. Lond., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Builth District of the counties of Brecknock and Radnor.

ROBINSON, HUGH, M.B. Glasg., has been appointed Acting Deputy Medical Officer of Health for the Saltash (Cornwall) Urban District.

STROVER, H. W. M., M.B., Ch.B. Aberd., has been appointed Temporary Medical Referee under the Workmen's Compensation Act, 1906, for the County Court Circuit No. 2, to be attached more particularly to the West Hartlepool County Court.

WALTERS, CHARLES FERRIER, F.R.C.S. Eng., L.R.C.P. Lond., has been appointed Honorary Surgeon to the Bristol Royal Infirmary.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

ANGLO-SERBIAN HOSPITAL, Vryjatchka, Ranja, Serbia.—Surgeon.

BIRMINGHAM, CITY FEVER HOSPITAL.—Female Resident Medical Officer. Salary £250 per annum, with board.

BIRMINGHAM AND MIDLAND EYE HOSPITAL.—Junior House Surgeon. Salary £100 per annum, with residence, board, &c.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street.—House Surgeon for six months. Salary at rate of £100 per annum, with board, lodging, and washing.

BRISTOL ROYAL INFIRMARY.—Resident Obstetric and Ophthalmic House Surgeon for six months. Salary at rate of £120 per annum, with board, apartments, and laundry. Also Dental House Surgeon for six months. Salary at rate of £120 per annum, with apartments, board, and laundry.

BURY INFIRMARY.—Senior House Surgeon. Salary £250 per annum, with board, residence, and washing.

BURY ST. EDMUNDS UNION.—Medical Officer for Saint James District. Salary £100 per annum and fees.

CHESTER COUNTY ASYLUM.—Third Assistant Medical Officer, unmarried. Salary £200 per annum, with board, lodging, and washing.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board and laundry.

DORSET COUNTY COUNCIL EDUCATION COMMITTEE.—School Dentist. Salary £260 per annum.

FOLKESTONE, ROYAL VICTORIA HOSPITAL.—House Surgeon. Salary £150 per annum, with board, residence, and laundry.

FRODSHAM, LIVERPOOL SANATORIUM, Kingswood.—Temporary Resident Medical Officer. Salary £30 per month, with board and residence.

GLASGOW ROYAL MATERNITY AND WOMEN'S HOSPITAL.—House Surgeons.

GUILDFORD, ROYAL SURREY COUNTY HOSPITAL.—House Surgeon. Salary £150 per annum, with board, residence, and laundry.

HASTINGS, EAST SUSSEX HOSPITAL.—House Surgeon. Salary £100 per annum, with board, residence, and laundry.

KIRKBURTON, NEAR HUDDERSFIELD, STORTHES HALL ASYLUM.—Locum Tenens. Salary £6 6*s.* per week, with board, lodging, and attendance.

LANCASHIRE COUNTY COUNCIL, HIGH CARLEY SANATORIUM, near Ulverston.—Medical Superintendent. Salary £450 per annum, rising to £560, with board, apartments, and washing.

LEEDS PUBLIC DISPENSARY.—Female Resident Medical Officer. Salary £130 per annum, with board, residence, and laundry.

LIVERPOOL EYE AND EAR INFIRMARY, Myrtle-street.—Honorary Anæsthetist.

LIVERPOOL INFIRMARY FOR CHILDREN.—Two Resident House Physicians and Resident House Surgeon for six months. Salary £30 in each case, with board and lodging.

MANCHESTER, COUNTY ASYLUM, Prestwich.—Assistant Medical Officer, unmarried. Salary £250 per annum, with board, apartments, attendance, and washing.

MANCHESTER, HULME DISPENSARY, Dale-street, Stretford-road.—House Surgeon. Salary £250 per annum, with apartments, attendance, &c.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—House Surgeon. Salary £120 per annum, with apartments and board.

MANCHESTER ROYAL INFIRMARY.—Assistant Director in the Clinical Laboratory for six months. Salary £75 per annum.

MIDDLESBROUGH, NORTH ORMESBY HOSPITAL.—House Surgeon. Salary £150 per annum, with board, residence, and washing.

NEWCASTLE-UPON-TYNE, UNIVERSITY OF DURHAM COLLEGE OF MEDICINE.—Demonstrator of Physiology. Salary £250 per annum.

NOTTINGHAM GENERAL HOSPITAL.—Assistant House Surgeon. Salary at rate of £250 per annum, with board, residence, and laundry.

PORTSMOUTH COUNTY BOROUGH.—Chief Tuberculosis Officer. Salary at rate of £500 per annum.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician, also House Surgeon, for six months. Salary £100 per annum, with board, residence, and washing.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Resident Medical Officer.

ST. MARY'S HOSPITAL, Paddington, W.—Resident Medical Officer to the Inoculation Wards for six months. Salary at rate of £100 per annum, with board and lodging.

ST. PETER'S HOSPITAL FOR STONE, &c., Henrietta-street, Covent Garden, W.C.—Junior House Surgeon for six months. Salary at rate of £75 per annum, with board, lodging, and washing.

SALISBURY GENERAL INFIRMARY—Assistant House Surgeon, unmarried. Salary £100 per annum, with apartments, board, lodging, and washing.

SHEFFIELD ROYAL INFIRMARY.—House Surgeon and Assistant House Physician. Salary £100 per annum, with board and residence.

SHREWSBURY, ROYAL SALOP INFIRMARY.—House Physician. Salary at rate of £120 per annum, with board, residence, and laundry.

SURREY EDUCATION COMMITTEE.—Temporary Female Assistant School Medical Officers.

SWANSEA EDUCATION COMMITTEE.—Female Assistant School Medical Officer and Temporary Assistant School Medical Officer. Salary in each case £300 per annum.

TINGWALL, WHITENESS, AND WEISDALE, PARISH OF.—Medical Officer and Public Vaccinator. Salary £45 per annum.

WALSALL AND DISTRICT HOSPITAL.—Assistant House Surgeon and Anæsthetist. Salary £150 per annum, with board, residence, and laundry.

WEST HAM AND EASTERN GENERAL HOSPITAL.—Resident Medical Officer. Salary £160 per annum. Also House Physicians and House Surgeons. Salary £120 and £100 per annum respectively, with board, residence, and washing.

WEST HAM UNION INFIRMARY, Whipps Cross-road, Leytonstone, N.E.—Third Assistant Medical Officer. Also Female Fourth Assistant Resident Medical Officer. Salary of former £200 and of latter £180 per annum, with residential allowances.

WEST HAM UNION WORKHOUSE, Union-road, Leytonstone, N.E.—Female Resident Assistant Medical Officer. Salary £180 per annum, with residential allowances.

WESTMINSTER GENERAL DISPENSARY, 9, Gerrard-street, Soho.—Resident Medical Officer. Salary £120 per annum, with rooms, gas, coals, and attendance.

WEST RIDING COUNTY COUNCIL, MIDDLETON-IN-WHARFEDALE SANATORIUM.—Temporary Resident Medical Superintendent. Salary £400 per annum, with board.

WHITCHURCH, NEAR CARDIFF, WELSH METROPOLITAN WAR HOSPITAL.—Resident Surgeon and Resident Physician.

WHITECHAPEL UNION INFIRMARY, Vallance-road, E.—Female Second Assistant Resident Medical Officer. Salary £200 per annum, with rations, apartments, and washing.

WIGAN, ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY.—Junior House Surgeon. Salary £150 per annum, with board, apartments, and washing.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Gamlingay, in the county of Cambridge.

Births, Marriages, and Deaths.

BIRTHS.

LEA.—On August 11th, at High-street, Manchester, the wife of Dr. C. Edgar Lea, of a son.

PATEY.—On August 12th, at Newton Abbot, the wife of Walter Patey, M.D. Lond., of a son.

PENROSE.—On August 15th, at West Bar, Banbury, Oxon, to Dr. and Mrs. N. C. Penrose, a son.

SLADDEN.—On August 12th, at the Park House, Port Talbot, to Arthur F. S. Sladden, M.D., Lieutenant, R.A.M.C., and Mary Christabel Sladden, a daughter.

MARRIAGES.

BRUNTON—MUIR.—On August 14th, at the Church of St. John, Knotty Ash, by the Vicar, the Rev. F. J. Powell, George L. Brunton, M.D., Lieutenant, R.A.M.C., to Lucy Mary Muir, M.B., only daughter of the late Robert Muir, Esq., of Upper Scapa, Orkney.

KING—SPINK.—On July 3rd, at Kingwilliamstown, South Africa, Gordon Burnham King, M.R.C.S., L.R.C.P., to Gladys Farley Spink, second daughter of Samuel M. Spink, of Reigate, Surrey.

LETTS—WHITTET.—On August 3rd, at 59, Hamilton Drive, Glasgow, W., by the Rev. Buchanan Blake, B.D., cousin of the bride, Bertram Chiene Letts, M.B., B.Ch., B.A.O., Lieutenant, R.A.M.C., to Kathleen Mabel, daughter of the late J. P. Whittet, J.P., and Lord Provost of Perth.

LONG—FAULKNER.—On August 16th, at Holy Trinity Church, West Hill, Wandsworth, Major Henry William Long, R.A.M.C., to Edith Frances Eleanor, daughter of Mr. and Mrs. Frederick Faulkner, of Woodlands, Putney Heath.

DEATHS.

EADE.—On August 12th, at St. Giles's-street, Norwich, after a short illness, Sir Peter Eade, M.D. Lond., F.R.C.P. Lond., Fellow of King's College, London, Consulting Physician to the Norfolk and Norwich Hospital, and Honorary Freeman of the City of Norwich, aged 91 years.

KELLAS.—On August 6th, killed in action at the Dardanelles, Arthur Kellas, M.B., Ch.B., D.P.H., Captain, R.A.M.C. (T.F.), Senior Medical Assistant, Royal Asylum, Aberdeen.

LEES HALL.—On August 15th, suddenly, at Sutherland-avenue, W., Lieutenant-Colonel John Lees Hall, R.A.M.C., aged 60 years.

SAVAGE.—On August 14th, at the New Zealand Military Hospital, Pont Koubba, Egypt, Major Thomas Copeland Savage, M.B., B.S., F.R.C.S., aged 41 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN, London.
The Secret of Human Power. By Haydn Brown, Fellow of the Royal Society of Medicine. Price 5s. net.

AMERICAN MEDICAL ASSOCIATION PRESS, Chicago.
Transactions of the American Pediatric Society, Twenty-sixth Session. Vol. XXVI. Edited by Dr. L. E. La Fétra.

BAILLIÈRE, TINDALL, AND COX, London.
Lectures on Elementary Anatomy and Physiology, including Short Sketches of Biology, Embryology, and Comparative Anatomy. By H. Clifford Barclay, M.D., Ch.B., F.R.C.S.E., M.R.C.S., L.R.C.P., Major, R.A.M.C. Second edition.

BLACKWOOD AND SONS, Edinburgh.
Some Points in Connexion with the Epidemiology and Pathology of Chicken Cholera. By J. P. McGowan, M.A., M.D., B.Sc., M.R.C.P.E.
Investigation into "Louping-Ill" or Trembling. By J. P. McGowan.
Some Points in Connexion with the Pathology and Epidemiology of Swine Fever. By J. P. McGowan.

CHURCHILL, J. AND A., London.
Text-book of Anatomy and Physiology for Training Schools and other Educational Institutions. By Elizabeth R. Bundy, M.D. Third edition, revised and enlarged. Price 8s. 6d. net.

FORDHAM UNIVERSITY PRESS, New York.
The Popes and Science: The History of the Papal Relations to Science. By James J. Walsh, M.D., Ph.D., Litt.D., Sc.D. Notre Dame, K.C.St.G., Professor of Physiological Psychology, Cathedral College, New York. A new enlarged edition. Price $2 net.

HEINEMANN, WILLIAM, London.
Modern Bone Setting for the Medical Profession. By Frank Romer, M.R.C.S. Eng., M.R.C.P. Lond. Price 5s. net.

PUBLISHED at 36, George-street, Manchester.
On the Significance of the Geographical Distribution of the Practice of Mummification. By Professor G. Elliot Smith, M.A., M.D., F.R.S. Price 2s. 6d.

SAUNDERS, W. B., COMPANY, London
Collected Papers of the Mayo Clinic, Rochester, Minn. Edited by Mrs. M. H. Mellish. Vol. VI. 1914. Price 24s. net.
Alveolodental Pyorrhœa. By Charles C. Bass, M.D., Professor of Experimental Medicine, Tulane Medical College; and Foster M. Johns, M.D., Instructor in the Laboratories of Clinical Medicine, Tulane Medical College. Price 12s. net.
Diarrhœal, Inflammatory, Obstructive, and Parasitic Diseases of the Gastro-Intestinal Tract. By Samuel Goodwin Gant, M.D., LL.D., Professor of Diseases of the Rectum and Anus at the New York Post-Graduate Medical School. Price 25s. net.
The Treatment of Fractures. With Notes upon a Few Common Dislocations. By Charles Locke Scudder, M.D., Surgeon to the Massachusetts General Hospital. Eighth edition, revised. Price 25s. net.
Diagnostic and Therapeutic Technic. A Manual of Practical Procedures Employed in Diagnosis and Treatment. By Albert S. Morrow, A.B., M.D., Clinical Professor of Surgery in the New York Polyclinic. Second edition, thoroughly revised. Price 21s. net.
Pathological Technique. A Practical Manual for Workers in Pathological Histology and Bacteriology. By Frank Burr Mallory, A.M., M.D., Associate Professor of Pathology, Harvard University Medical School; and James Homer Wright, A.M., M.D., Pathologist to the Massachusetts General Hospital. Sixth edition, revised and enlarged. Price 13s. net.
The Pocket Medical Dictionary. Edited by W. A. Newman Dorland, A.M., M.D., containing the Pronunciation and Definition of all the Principal Terms used in Medicine and the Kindred Sciences, including Dentistry, Veterinary Medicine, Nursing, &c. With over 60 extensive tables. Ninth edition, revised and enlarged. Price 5s. net.

UNWIN, FISHER, London.
Fighting the Fly Peril: A Popular and Practical Handbook. By C. F. Plowman and W. F. Dearden, Medical Officer of Heath for the Port of Manchester. Introduction by A. E. Shipley, Sc.D., F.R.S. Price 1s. net.

YEAR BOOK PRESS, London.
Girls' School Year Book, 1915. Price 3s. 6d. net.

Notes, Short Comments, and Answers to Correspondents.

STUDENTS' NUMBER OF THE LANCET.

INFORMATION intended for the Students' Number of THE LANCET must be sent WITHOUT DELAY, addressed to the Sub-Editor, and marked on the envelope "Students' Number Only."

SURVIVAL OF WAR PENSIONERS.

A FREQUENT correspondent writes:—"It is interesting to surmise, now that the great war has lasted a year and pensions to widows, orphans, and survivors are a matter for growing consideration, to what extent they will increase and how many years they will last. The questions of survivorship involved are interesting and may bring to light some difficulties. Light has been thrown on the subject by the Commissioner of Pensions of the United States of America at Washington. The American Civil War lasted from April, 1861, to May, 1865, and the number of individuals in the military and naval service of the United States during that war is estimated at 2,213,365. As the number of survivors on the pension roll is officially stated now to be less than 500,000, it is evident that 75 per cent. or more of those who rendered service in the Civil War are deceased. The annual death-rate of the survivors is nearly 7 per cent. and the average age is approximately 71 years.

The pension roll of the 'Revolutionary War' (1775–83), in which it has been estimated there were engaged about 300,000, was cleared off in 1906 when the last widow pensioner, named Esther S. Damon, of Plymouth Union, Vt., died on Nov. 11th, aged 92 years, but the last actual survivor of the Revolution died on April 5th, 1869, aged 109 years 6 months and 8 days at Freedom, Cattarangus County, N.Y., by name Daniel F. Bakeman. The last surviving pensioned soldier of the war of 1812 with Great Britain (June, 1812, to February, 1815), when 605,000 troops were engaged, died on May 13th, 1905, aged 105 years and 16 days. His name was Hiram Cronk, of Ava, N.Y. There were, however, in 1912 at the beginning of the year 279 widows of the war of 1812 receiving pensions, but at the end of 1912 41 had died, leaving 238 widows then surviving. All the above figures are quoted from the official statements, but it is clear that widows of soldiers, whose services terminated in 1815, must have been well over 100 years of age by 1912. It is notorious that the American pension lists were much exploited, and badly supervised."

SOME FIJI STATISTICS.

IN a report on the Blue-book of the colony of Fiji for the year 1914, Mr. Eyre Hutson, C.M.G., the Colonial Secretary, states that the estimated population of the islands on Dec. 31st was 155,167, comprising 4453 Europeans, 2567 half-castes, 53,589 Indians, 88,775 Fijians, 2525 Polynesians, 1958 Rotumans, 511 Chinese, and 789 others. These figures show an increase of 15,626 as compared with the census of April, 1911. During 1914 there were introduced into the colony 1572 Indian immigrants, as against 3111 in the previous year. The indentures of 1600 immigrants expired during the year. The total number of East Indians serving under indenture on the last day of 1914 was 15,602 (male adults, 9644; female adults, 3430; and children, 2528); and of time-expired indentured immigrants, remaining or settling in the colony, there were 37,754. The death-rate amongst these in 1914 was lower than in any previous year. Special attention is being devoted to the question of effecting a reduction in the death-rate among children.

The colonial hospital at Suva, the principal medical institution in the colony, is under the supervision of the chief medical officer, with a resident medical officer in charge, who is assisted by a junior medical officer. The nursing staff consists of a matron, a senior and a junior staff nurse, a graduate nurse, and six probationers. The number of patients treated in the hospital in 1914 was 1767, of whom 189 were Europeans. There is at Levuka a branch hospital under the charge of the district medical officer, assisted by a European and a native nurse. There are 11 provincial hospitals for the treatment of native Fijians. These are supervised by Government medical officers. The number of admissions in 1914 was 3793. At Suva there is a lunatic asylum for the reception of patients of both sexes of all nationalities, and there is separate accommodation for Europeans. The senior medical officer is superintendent, and the chief medical officer is a member of the Board of Visitors. The staff consists of a European head attendant and a European matron, with native attendants. During the year there were 27 admissions and 10 discharges, and 36 patients remained at the end of the year. In the leper asylum on the island of Makogai there were, on Dec. 31st, 279 lepers. The asylum is under the charge of a medical superintendent, who is assisted by a European medical officer, and five European and three Fijian nursing sisters.

The total rainfall recorded at Suva during the year was 140·247 in., as against 122·539 in. in 1913 and 115·406 in. in 1912. The greatest rainfall on any one day was 6·040 on Dec. 23rd. Although the usual dry season is from May to September, the wettest month was May, with 21·970 in., and the driest November with 0·53 in. The mean relative humidity for the year was 80·2 per cent. The mean shade temperatures at Suva were 70·9° minimum and 81° maximum. The average temperature was 76° F. The highest temperature recorded was 93° on Feb. 7th, and the lowest 57·4° on August 20th (this being the lowest temperature on record for Suva). The hottest month was February with an average temperature of 86·5° maximum, and 75·7° minimum, and the coolest month was August with an average of 73·7° maximum and 66·3° minimum.

HOLIDAYS AND HUSTLE.

THE withdrawal of all excursion facilities on our railways has had the marked effect of keeping a large percentage of our holiday makers at home during the month of August—the great holiday season of the year. The value of holidays is very great, but it must be admitted that the hustling holiday has its drawbacks, and some of those who have missed their yearly vacation may be better off in consequence. Instead of rushing off, as has been usual, to places necessitating railway journeys occupying many hours at a stretch—and, possibly, an unpleasant sea trip sandwiched—they have been content with excursions into the country day by day, exploring the beauties of their own county hitherto unknown to them. They have spent a summer holiday quietly and restfully without the fatigue of a long railway journey and the concomitant anxieties about the luggage, the strange bed at the hotel or apartments. A holiday of needless hustle may be a holiday in the everyday acceptance of the term, but it is not one likely to lead to a feeling of subsequent rest.

FOOD VALUES AND THE CONSERVATION OF FOOD-SUPPLIES.

Professor W. H. Thompson, M.D., of Trinity College, Dublin, has compiled a very useful and instructive pamphlet setting forth in homely terms the value of various foods and how best to utilise them. He points out, in particular, where waste can be avoided and the numerous directions in which the choice of a food is wrong owing to an ignorance of simple chemical and physiological facts. A number of useful recipes are given. The pamphlet includes an interesting table showing the yield of protein and food energy per statute acre of ground when, on the one hand, it is used for growing wheat, peas, and potatoes, and so forth, and, on the other, when it is used for raising live stock. The conclusion is thus reached that, taking the mean yield of food per statute acre in beef or mutton as 260 oz. of protein and 290,000 units of food energy, the output of eatable potatoes furnishes 17 times as much protein and 30 times as much food energy; that of wheat 19 times as much protein, and 15 times as much food energy; that of beans 20 times as much protein and 9 times as much energy; that of peas 10 times as much protein and 4 times as much food energy, as if the acre of land were used for grazing. This does not necessarily enjoin a purely vegetable diet, for he points out that the yield of an acre of land in potatoes furnishes as bacon nearly 5 times as much protein and more than 7 times as much food energy as if the land were used for grazing sheep or cattle. These considerations would seem to neglect the fact that sheep and cattle are valuable in other ways than as food. If we limited our farming to pigs and vegetables we should obviously cut off our supply of wool and leather, not to say butter, cheese, and milk. The proceeds of the sale of this pamphlet are to be devoted to the Dublin University Voluntary Aid Detachment Hospital.

VITAL STATISTICS OF GIBRALTAR.

FROM the Gibraltar Blue-book for 1914, just presented to Parliament, it appears that the civil population in the city and harbour which at the Census of 1911 amounted to 19,586 has now fallen to 18,036. The number of births last year amongst the civil population was 388, and amongst the naval and military population 114—total 502. The deaths recorded were: civil 259, naval and military 18, floating 48—total 325. At the Colonial Hospital the daily average number of patients under treatment in the wards was 45; the total number treated, including those remaining in the hospital at the end of

1913 (58) was 672 (479 males and 193 females). There were 45 deaths (30 males and 15 females). The number of patients who underwent surgical operations was 291, of whom 6 subsequently died. The out-patients totalled 7703. The small-pox branch of the hospital received 4 patients and there was 1 death. At the tuberculosis dispensary, managed by the Sanitary Commissioners, an average of 13 patients weekly were inspected and treated. In the tuberculosis home, under the same management, 16 adults and 26 children, members of 8 different families, were accommodated. Eight destitute British subjects suffering from diseases other than tuberculosis were provided with medical attendance, nursing, and lodging under the destitute scheme. The daily average number of inmates in the lunatic asylum was 33 (22 males and 11 females) and there were 3 deaths.

The mean maximum temperature for 1914 was 69·2° F and the mean minimum 57·3°; the absolute maximum was 90·0° on Sept. 19th, and the absolute minimum 35·0° on Jan. 7th. The rainfall for the year was 36·75 in. (as against 26·11 in 1913), the greatest fall in 24 hours being 5·73 in. on Nov. 7th.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—10 A.M., Dr. Simson: Diseases of Women. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. D. Armour: Operations. Dr. Pritchard: Bacterial Therapy Department. Mr. B. Harman and Mr. Gibb: Diseases of the Eye.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women. Mr. Gibb: Diseases of the Eye.

THURSDAY.—9 A.M., Dr. Bernstein: Bacterial Therapy Department. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. D. Armour: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

For further particulars of the above Lectures, &c., see Advertisement Pages.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index and Title-page to Vol. I. of 1915, which was completed with the issue of June 26th, were given in THE LANCET of July 3rd.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1915 are now ready. Bound in cloth, gilt lettered, price 16*s.*, carriage extra.

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METEOROLOGICAL READINGS.

(Taken daily at 9.30 a.m. by Steward's Instruments.)

THE LANCET Office, August 18th, 1915.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Aug. 12	29·976	S.W.	0·25	124	72	62	61	64	Cloudy
,, 13	29·906	S.W.	0·04	122	71	57	58	60	Cloudy
,, 14	29·920	W.	0·09	123	73	55	58	61	Cloudy
,, 15	29·970	S.W.	0·84	108	65	56	59	62	Cloudy
,, 16	29·910	W.	...	119	70	55	57	58	Cloudy
,, 17	30·000	W.	0·07	110	70	55	56	59	Fine
,, 18	30·074	E.	...	112	69	57	56	58	Cloudy

The following magazines, journals, &c., have been received:—Tropical Diseases Bulletin, Midland Medical Journal, Symons's Meteorological Magazine, British Journal of Dental Science, Modern Hospital, Interstate Medical Journal, Bulletin of the Johns Hopkins Hospital, Surgery, Gynæcology, and Obstetrics, Journal of Surgery, Saint Paul Medical Journal, Clinical Medicine.

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